
Trade Name: Manganese Electrolytic Flakes

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1. Product identifier

Trade name: Manganese Electrolytic flakes

CAS Number: 7439-96-5

Other means of identification:

Electrolytic Manganese Metal

Manganese Metal

Metallic Manganese in Flake Form

Mn

Mn99.9

1.2. Recommended use and restrictions

Recommended Use:

Sector of Use:

SU8 Manufacture of bulk, large scale chemicals (including petroleum products)

SU9 Manufacture of fine chemicals

SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

SU13 Manufacture of other non-metallic mineral products, e.g. plasters, cement

SU14 Manufacture of basic metals, including alloys

SU15 Manufacture of fabricated metal products, except machinery and equipment

SU16 Manufacture of computer, electronic and optical products, electrical equipment

SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Product category:

PC7 Base metals and alloys

PC19 Intermediate

PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents

PC24 Lubricants, greases, release products

PC29 Pharmaceuticals

PC38 Welding and soldering products (with flux coatings or flux cores.), flux products

PC39 Cosmetics, personal care products

Process category:

PROC1 Use in closed process, no likelihood of exposure

PROC2 Use in closed, continuous process with occasional controlled exposure

PROC3 Use in closed batch process (synthesis or formulation)

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises

PR005 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC6 Calendaring operations

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

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PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14 Production of preparations or articles by tableting, compression, extrusion, palletisation
PROC15 Use as laboratory reagent
PROC22 Potentially closed processing operations with minerals/metals at elevated temperature – Industrial setting
PROC23 Open processing and transfer operations with minerals/metals at elevated temperature
PROC25 Other hot work operations with metals

Environmental release category:

ERC1 Manufacture of substances
ERC2 Formulation of preparations
ERC3 Formulation in materials
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b Industrial use of reactive processing aids

Article category:

AC1 Vehicles
AC2 Machinery, mechanical appliances, electrical/electronic articles
AC3 Electrical batteries and accumulators
AC7 Metal articles

Application of the substance/the mixture:

Manganese metal

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

The substance is not classified as hazardous according to the Globally Harmonized System (GHS).

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2.2. Label elements

GHS label elements Not regulated.

Hazard pictograms: Not regulated.

Signal word: Not regulated.

Hazard statements: Not regulated.

Precautionary statements: Not regulated

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	Reach Registration No
MANGANESE	7439-96-5	231-105-1	>99	01-2119449803-34

4. FIRST AID MEASURES

4.1. Description of first aid measures

After inhalation:

Do not inhale. Wear appropriate mask

Unlikely route of exposure.

Supply fresh air; consult doctor in case of complaints.

After skin contact:

Brush off loose particles from skin. Wash with soap and water or diphoterine.

If skin irritation is experienced, consult a doctor.

Wear appropriate protective equipment and avoid skin contact. Skin protection is a must.

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.

Eye protection is a must.

After swallowing:

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; immediately call for medical help.

Do not ingest or swallow the substance.

Self-protection of the first aider:

Wear correct personal protective equipment

Avoid contact to Manganese powder

Most important symptoms and effects, both acute and delayed:

Gastric or intestinal disorders when ingested. Nausea in case of ingestion. Dust particles cause eye irritation/itchiness and lung irritation/coughing. Avoid skin contact as the substance is a skin sensitizer.

Indication of any immediate medical attention and special treatment needed:

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No relevant information available.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing agents:

Fire-extinguishing powder

Limestone powder

Dry sand.

For safety reasons unsuitable extinguishing agents:

Water.

5.2. Special hazards arising from the substance or mixture

The substance does not decompose natural. However, upon combustion produces fumes of metallic oxides and oxides of carbon.

5.3. Advice for firefighters

Protective equipment:

Wear self-contained respiratory protective device. Wear fully protective suit. Remain on the upwind side notify or evacuate people on the downwind side.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For Non-emergency personnel:

Ensure adequate ventilation.

Dust mask and safety goggles are a must.

Avoid formation of dust.

Avoid all ignition sources

Use personal protective equipment as required, see section 8

6.1.2 For emergency Responders:

Ensure adequate ventilation.

barricade the hazardous area

Avoid formation of dust.

Use personal protective equipment as required, see section 8

6.2. Environmental precautions

Avoid release to the environment.

Damp down dust with water spray.

6.3. Methods and material for containment and cleaning up

Pick up mechanically.

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Send for recovery or disposal in suitable receptacles.

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 Precautions for safe handling:

Protective Measures

Any deposit of dust which cannot be avoided must be regularly removed.

Do not dry clean dust covered objects and floors. Wash thoroughly with plenty of water.

Use only in well ventilated areas.

Avoid handling with incompatible substances like Oxidizers, strong bases, strong acids.

Avoid dust generating operations or must be carried out in a properly ventilated area while wearing appropriate PPE

Advice on general occupational hygiene

Do not eat, drink or smoke in contaminated area

Wash hands before and after use and keep them dry

Remove contaminated clothing and personal protective equipment before entering eating areas.

Information about protection against explosions and fires:

Dust can combine with air to form an explosive mixture.

7.2 Conditions for safe storage, including any incompatibilities

7.2.1 Storage Requirements:

a) Risk management associated to physical and chemical properties

Explosive atmosphere: the substance is not explosive, however, store material away from possible explosive materials.

Corrosive conditions: The substance does not corrode metal; hence no adverse corrosive effects are expected.

Flammability Hazard: The substance is not flammable, however, keep away from flammable materials.

Incompatible substances or mixtures: Oxidizers, strong bases, strong acids

Evaporative conditions: Avoid storage around organic evaporative materials/substances

Potential ignition sources: Keep away from ignition sources

b) How to control effects from environmental conditions: Weather conditions, ambient pressure, varying temperatures, sunlight and vibration do not affect the integrity of the substance. However, storage environments should be protected from humid and water.

c) How to maintain the integrity of the substance: The substance is very stable under normal conditions of use. It does not decompose or disintegrate. Stabilisers and antioxidants are not required.

d) Other advice

Ventilation requirements: Ensure adequate ventilation and store at room temperature.

Requirements to be met by storerooms and receptacles:

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Avoid storage near extreme heat, ignition sources or open flame.
Protect from humidity and water.

Information about storage in one common storage facility:

Store away from foodstuffs.

Store away from oxidizing agents

Further information about storage conditions: Keep containers tightly sealed.

7.3 Specific end use(s)

No relevant information available.

8 EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Components with limit values that require monitoring at the workplace:

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 como 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.

Avoid contact with the eyes.

Avoid close or long-term contact with the skin.

Engineering controls: Dust should be trapped and recycled where possible. Waste water is collected for treatment and recycled.

Breathing equipment:

Not required under normal conditions of use.

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Wear appropriate NIOSH respirator when ventilation is inadequate and occupational exposure limits are exceeded.

For spills, respiratory protection may be advisable.

Use respiratory protection when grinding or cutting material.

Protection of hands:

Wear PVC or Rubber gloves.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Eye protection: Wear dust proof goggles.

Body protection: Not required under normal conditions of use. Protection may be required for spills.

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 material Flakes
Colour:	Silver-grey and/or dull brown
Odour:	Nearly odourless
Odour Threshold	Not determined.
pH-value:	Not applicable.
Melting point/Melting range:	1245-1246 °C (2273-2275 °F)
Boiling point/Boiling range:	2061-2097 °C (3742-3807 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Solid product is not flammable.
Auto-ignition temperature:	Not applicable.
Decomposition temperature:	Not determined.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits	
Lower:	Not determined.
Upper:	Not determined.
Oxidizing properties:	Non-oxidizing
Vapor pressure at 955 °C (1751 °F):	1 Pa
Density:	
Relative density:	7.2 g/cm³ (60.084 lbs/gal)
Vapor density:	Not applicable.
Evaporation rate:	Not applicable.

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Solubility in / Miscibility with Water:	Insoluble.
Partition coefficient (n-octanol/water):	Not applicable.
Viscosity Dynamic: Kinematic: Other information	Not applicable. Not applicable. No relevant information available.

10 STABILITY AND REACTIVITY

10.1 Reactivity

Thoroughly check 10.2 to 10.5

10.2 Chemical stability

The chemical is stable under recommended conditions of storage, use, and temperature.

10.3 Possibility of hazardous reactions

Reacts with strong acids and oxidizing agents.

Reacts with strong alkali.

10.4 Conditions to avoid

Moisture.

Prevent formation of dust.

10.5 Incompatible materials

Oxidizers, strong bases, strong acids

10.6 Hazardous decomposition products

Under fire conditions only: Toxic metal oxide smoke can be released 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: Slight irritant effect on skin and mucous membranes.

On the eye: Slight irritant effect on eyes.

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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. Eye contact. Skin contact.

CMR effects (carcinogenetic, 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: Based on available data, the classification criteria are not met.

STOT-repeated exposure: Based on available data, the classification criteria are not met.

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

12 ECOLOGICAL INFORMATION

12.1 Toxicity

Acute (short term) toxicity

- a) **Fish:** OECD guidelines 203, EU method C1 and GLP. LD50 (96h) for fresh water fish: > 3.6 mg/L.
- b) **Crustacean:** OECD guideline 202, EU method C2 and GLP. EC50/LC50 (48h) for fresh water invertebrates: >1.6 mg/L
- c) **Algae/aquatic plants:** OECD 201, EU method C3 and GLP. EC50/LC50 (72h): 4.5 mg/L. EC10/LC10 (72h): 3.4 mg/L. NOEC (72h): 2.5 mg/L
- d) **ASRI (Activated sludge respiratory inhibition):** OECD guideline 209, EU method C11 and GLP. EC50: >1000 mg/L; NOEC (>3h): >1000 mg/L
- e) **Chronic (long-term) toxicity:**
 - Crustacean- Daphnia reproductive test:** OECD guideline 211 and GLP. NOEC (8d): 1.7 mg/L.

12.2 Persistence and degradability

The substance does not have the potential for persistence.

12.3 Bio accumulative potential:

The substance does not have the potential to bioaccumulate.

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12.4 Mobility in soil:

The substance does not have the potential to move into ground water

12.5 Results of PBT and vPvB assessment

No assessment was carried out as the substance is a naturally occurring ore which is except from REACH registration. However, based on its properties, it is predicted not to be PBT or vPvB

12.6 Endocrine disrupting properties

The substance is not considered as an endocrine disruptor based on available literature – Data lacking

12.7 Other adverse effects

No relevant information available.

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Recommendation:

Contact waste processors for recycling information. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non-hazardous wastes.

13.2 Uncleaned packaging

Recommendation: Disposal must be made according to official regulations.

14 TRANSPORT INFORMATION

UN-Number DOT, ADR, IMDG, IATA	Not regulated.
UN proper shipping name DOT, ADR, IMDG, IATA	Not regulated.
Transport hazard class(es) DOT, ADR, IMDG, IATA Class	Not regulated.
Packing group DOT, ADR, IMDG, IATA	Not regulated.
Environmental hazards Marine pollutant:	No
Special precautions for user	Not applicable.

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Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

15 REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
United States (USA)

SARA

Section 302 (extremely hazardous substances):

Substance is not listed

Section 355 (extremely hazardous substances):

Substance is not listed.

Section 313 (Specific toxic chemical listings):

Substance is listed.

TSCA (Toxic Substances Control Act)

Substance is listed.

Proposition 65 (California)

Chemicals known to cause cancer:

Substance is not listed.

Chemicals known to cause reproductive toxicity for females:

Substance is not listed.

Chemicals known to cause reproductive toxicity for males:

Substance is not listed.

Chemicals known to cause developmental toxicity:

Substance is not listed.

Carcinogenic categories

EPA (Environmental Protection Agency):

IARC (International Agency for Research on Cancer):

Substance is not listed.

NIOSH-Ca (National Institute for Occupational Safety and Health):

Substance is not listed.

Canadian Domestic Substances List (DSL):

Substance is listed.

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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 02/05/2017 / - 25-02-2025

Revision on section: 1,11 & 16

Abbreviations and acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society) LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health

LDLo: Lowest Lethal Dose Observed

Sources

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

Website, US EPA Substance Registry Services (ofmpub.epa.gov/sor internet/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

SDS PREPARED BY:

MANGANESE METAL COMPANY

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MBOMBELA

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TEL NUMBER (013) 7594600

WEBSITE: WWW.MMC.CO.ZA

17 AMENDMENT HISTORY

The following information documents the last changes

Date	Revised by	Changes
27 August 2017	S Kampers Parsley Studios	Changed MMC logo and the document format, no changes to the actual content of the document was made.

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04 May 2018	Twice Mnisi	Section 9 of the MSDS: added dull brown on Manganese flake color
14 April 2021	Twice Mnisi	Incorporated MARA's additional Knowledge in section 1,2, 3, 4, 6, 7, 12, 13, 14, and 16
25 February 2025	Twice Mnisi	Addition on section 1, 11 and 16