
This substance does not meet the EU Regulation No. 1907/2006 requirements for a mandatory safety data sheet. This safety information sheet is therefore issued voluntarily as a corporate social responsibility act for safe handling.

SAFETY INFORMATION SHEET: MANGANESE METAL
Provided in accordance with article 18(2) of Regulation (EC) No 1272/2008

SECTION 1: IDENTIFICATION

1. **Product identifier:**

Product name: Manganese
Other name: Manganese metal (Powder, Lumps, Briquettes)
EC No.: 231-105-1
CAS No.: 7439-96-5
REACH Registration number: **[If applicable]**
Unique formula identifier (UFI): Not applicable for this substance

2. **Relevant identified uses of the substance/mixture and uses advised against:**

This substance is used as raw material for the manufacture of various grades of stainless steel and specialty steel.
SU 14: Manufacture of basic metals, including alloys.
SU 15: Manufacture of fabricated metal products, except machinery and equipment.
SU 16: Manufacture of computer, electronic and optical products, electrical equipment.
SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.
SU 18: Manufacture of furniture.
SU 19: Building and construction work uses.
Product category used: Base metals and alloys – PC7 and PC 38: Welding and soldering products, flux products.
Add or delete the above to suit your company's needs
No known uses advised against.

3. **Details of the supplier of the safety product information: Complete as required**

1.3.1 Name of supplier or manufacturer: (including address, phone numbers etc: Complete as required.

1.3.2 Person responsible in EU member state / Only Representative information: Complete as required.

4. **Emergency telephone: Complete as required (For EU add 112). CIAV# of receiving country**

SECTION 2: HAZARD(S) IDENTITIFCATION

1. **Classification of the substance or mixture:**

11 rue Dulong – 75017 Paris - France
Tel : +33 (0) 1 45 63 06 34 Fax : +33 (0) 1 42 89 42 92
E-mail : reach@manganese.org - Web site : www.reach-manganese.org

This substance does not meet the criteria for classification according to the UN GHS and EC Classification Labelling and Packaging Regulation (EC) No. 1272/2008 (CLP) applicable for substances and mixtures

2. **Label elements:** Not classified hence no labelling is required.
3. **Other hazards:**

None of the constituent substances are considered to meet the criteria to be included in the following hazard classes, at this time based on available information:

- ED HH (Endocrine disruption for human health)
- ED ENV (Endocrine disruption for the environment)
- PBT (persistent, bioaccumulative, toxic),
- vPvB (very persistent, very bioaccumulative)
- PMT (persistent, mobile, toxic)
- vPvM (very persistent, very mobile)

Studies: Available information on invitro testing using Mn as the test substance on various thyroid investigations – DIO-1, TPO, TRβ CALUX and TTR TRβ CALUX confirmed negative results.
None of the constituent substances were included in the list established in accordance with Article 59(1) for having endocrine disrupting properties, nor are they identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/210056 or Commission Regulation (EU) 2018/60557.
May form explosible dust-air mixture if dispersed.
See section 8 for personal protection. Include other hazards if known.
During handling: If a significant amount of dust is present, precautions should be taken to limit this exposure through normal control procedures such as local exhaust ventilation (LEV) or respiratory protective equipment (RPE).
During use: Fumes may be produced during the melting operations. Manganese may be present in these fumes in oxidized forms, some of which maybe hazardous. Precautions should be taken to limit this exposure through normal control procedures such as local exhaust ventilation (LEV) or respiratory protective equipment (RPE).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance(s) and impurities [Complete as appropriate]

Manganese is an inorganic mono-constituent substance. Its impurities are negligible and do not influence the classification.

Chemical name	EC No.	CAS number	Nominal % w/w	REACH Registration No.
Manganese	231-105-1	7439-96-5	>95% (Amend as appropriate)	01-2119449803-34-xxxx
Impurity 1: Carbon	231-153-3	7440-44-0	Complete as per your product	-
Impurity 2: Sulfur	231-722-6	7704-34-9	Complete as per your product	-
Impurity 3: Selenium	231-49-2	7782-49-2	Complete as per your product	
Additional information: No H-statements are required for this product				

SECTION 4: FIRST AID MEASURES

1. **Description of first aid measures: FOR REACH REGISTRANTS INFORMATION IN THIS SECTION MUST ALIGN WITH THAT OF THE GUIDANCE OF SAFE USE IN YOUR DOSSIER (IUCLID SECTION 11)**

1. **General information: N**ot anticipated to cause any harm if in contact with clothing, skin or eye. However, in case of accident or unwellness, seek medical advice immediately.
2. **Following inhalation:** Do not inhale. Wear an appropriate mask. Coughing can be expected as an immediate effect, delayed effects are not expected. Move

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3. exposed individual to fresh air Include other relevant information based on your company's procedures.

3. **Following skin contact:** Include information based on your company's procedures.

4. **Following eye contact:** Include information based on your company's procedures.

5. **Following ingestion:** Include information based on your company's procedures.

6. **Self-protection of the first aider:** Include information based on your company's procedures.

2. **Most important symptoms and effects, both acute and delayed:** Dust particles could cause eye irritation/itchiness and lung irritation/coughing Breathing difficulties may occur immediately in the event of excessive dustiness due to lung overload.

3. **Indication of any immediate medical attention and special treatment needed:** Include information based on your company's procedures.

SECTION 5: FIRE-FIGHTING MEASURES

1. **Extinguishing media:** Mn is not combustible. Include information on an appropriate extinguishing media and any unsuitable extinguishing media based on your company's procedures.

2. **Special hazards arising from substance or mixture:** The substance does not decompose naturally. However, upon combustion produces fumes of metallic oxides and oxides of carbon. Include any other relevant information.

3. **Advice for fire-fighters:** Not combustible under normal conditions of use but fine powders can combust. Wear suitable personal protective equipment (including self-contained breathing apparatus (SCBA) and full protective clothing) when extinguishing fires. Include information based on your company's procedures.

SECTION 6: ACCIDENTAL RELEASE MEASURES

1. **Personal precautions, protective equipment and emergency procedures:**

Eye protection and respirators should be worn where dust is a potential hazard. Gloves should be worn when handling this material because of the risk of contact with sharp particles. When dealing with powders avoid generating dust and remove all sources of ignition.

6.1.1 For non-emergency personnel:

a) Use personal protective equipment, such as dust masks, goggles and overalls to minimise inhalation. Eye and skin contact should be avoided for good industrial hygiene purposes. See section 8 for more details.

b) Must have dust control and sufficient ventilation**.** Avoid all ignition sources

c) In the event of accidental release, evacuate the immediate area and consult trained personnel.

6.1.2 For emergency responders:

Remove persons to safety. Isolate hazard area and deny entry. Ventilate closed spaces before entering. Use personal protective equipment - Specify which to use/which not to use, see section 8 and 13 – Amend as per your company procedures.

2. **Environmental precautions:**

The product is not considered an environmental hazard based on the available studies. However, it is advisable to keep away from drains as large quantities could clog drains. Avoid release to surface and groundwater. Include other information based on your company's procedures.

3. **Methods and material for containment and cleaning up:**

The product is not considered an environmental hazard based on the available studies. However, it is advisable to keep away from drains as large quantities could clog drains.

6.3.1 For containment: Collect in closed and suitable containers for disposal or reuse Include other information based on your company's procedures.

6.3.2 For cleaning up: Spills should be contained and recovered mechanically if possible. Collect dust or particulates using a vacuum cleaner with a high efficiency particulate air (HEPA) filter. Place in a designated, labelled waste container. Dispose of in accordance with local regulations. Contaminated objects and areas thoroughly observing environmental regulations -include cleaning and vacuuming techniques.

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6.3.3 Other information: Avoid excessive dust generation. Material may be reclaimed for re-use. Include information based on your company's procedure such as clean-up techniques/materials never to be used.

4. **Reference to other sections:**

For Personal protective equipment and appropriate disposal: see section 8 and 13.

SECTION 7: HANDLING AND STORAGE

1. **Precautions for safe handling:** This product is an insoluble, metallic solid, ranging in size from lumps to fine particles (see section 9). It is not regarded as representing a particular hazard to health nor the environment. However, safe industrial hygiene practices should be employed. In its powder (in high concentration) form, it may combust (like all fine powders in high concentration) to form hazardous metallic and non-metallic gases.

7.1.1 Protective measures:

a) Use only in well-ventilated areas. Avoid generating dust. Wear personal protective clothing (see Section 8). Include other information based on your company's procedures.

b) Avoid handling with incompatible substances/mixtures (List incompatible substances if known)

c) Avoid dust generating operations or must be carried out in properly ventilated areas while wearing appropriate PPE

d) Capture dust, if possible, if generated, vacuum dust and compress into pellets to minimize environmental exposure and recycle if possible- Amend as per company procedures.

7.1.2 Advice on general occupational hygiene:

a) Do not eat, drink or smoke in work areas.

b) Wash hands before and after use and keep them dry.

c) Remove contaminated clothing and personal protective equipment before entering eating areas - Include other information based on your company's procedures.

7.2 Conditions for safe storage, including any incompatibilities:

7.2.1 Technical measures and storage conditions:

a) Risk management associated to physical and chemical properties

i) Explosive atmosphere: The substance is not explosive, however, store the substance away from explosive materials

ii) Corrosive conditions: The substance does not corrode metal, hence no adverse corrosive effects are expected

iii) Flammability hazard: The substance is not flammable, however, keep away from flammable materials

iv) Incompatible substances or mixtures: Store away from acids and oxidizing agents (List if known)

v) Evaporative conditions: The substance does not evaporate. Avoid storage around organic evaporative materials/substances.

vi) Potential ignition sources: Keep away from ignition sources

b) How to control effects from environmental conditions: (i) Weather conditions, (ii) ambient pressure, (iii) varying temperatures, (iv) sunlight, (v) humidity and (vi) vibration do not affect the integrity of the product. However, storage environments should not be very humid – Amend as per your company's procedures.

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

d)) Other advice:

i) Ventilation requirements: Ensure adequate ventilation and store at room temperature. At the same time, there are no specific issues for storage in an open warehouse, in a closed warehouse, in frost or heat. Concentrations of dust should be controlled. In severe frost, pieces of the product can freeze. Amend as per your company's procedures.

ii) Specific designs for storage: Keep/store in original containers/packaging. Can be stored in bulk in stacks. Keep product dry, especially if used in high temperature applications in contact with molten metal. Amend as per your company's procedures.

iii) Quantity limits under storage conditions: There is no limitation as the product does not pose any physical and chemical hazard. Amend as per your company's procedures.

iv) Packaging compatibility: Store in original/similar packaging or can be stored in bulk in stacks. Protect container/packaging against damage. Amend as per your company's procedures.

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7.3 Specific end uses(s):

This substance is used as raw material for the manufacture of all grades of steel. Observe instructions for safe use

SECTION 8: EXPOSURE CONTROLS/ PERSONAL PROTECTION

1. **Control parameters:**
   1. **Occupational exposure limits:** The EU SCOEL OEL values for Manganese and its inorganic compounds are 0.2mg/m3 – inhalable and 0.05mg/m3 respirable.

8.1.1.1 National occupational exposure limits - Europe: (all forms of Manganese): 8 hours TWA – 0.2mg/m3 (inhalable fraction); 0.05 mg/m2 (respirable fraction)
STEL (15 mins) – Not assigned
Biological limit value – Not assigned. Include other relevant country specific workplace limits

8.1.1.2 Union limits: 0.2mg/m3 inhalable and 0.05mg/m3 respirable

8.1.1.3 Any other national exposure limit values: Include if available.

8.1.1.4 Union biological limit values: No Union biological limit values exist for Inorganic manganese and its compounds

8.1.1.5 Any other national biological limit values: Include if available.

8.1.2 Monitoring Procedures: Dust monitoring is recommended, provide methodology as per national laws/company procedures.

8.1.3 Formation of air contaminates: The substance does not produce air contaminants under normal conditions of use. OEL/BLV are therefore not provided Amend as per your company's use.

8.1.4 Derived No Effects Limits (DNELs)/Predicted No Effects Concentrations (PNECs):

Hazard assessment conclusion for workers: DNELS

Route	Type of effect	Hazard conclusion	Most sensitive endpoint
Inhalation	Systemic effects Long-term	-DNEL (Derived No Effect Level) 0.2mg/m³	
Inhalation	Systemic effects Acute	-no-threshold effect and/or no dose-response information available	
Inhalation	Local effects Long-term	-other toxicological threshold 0.2mg/m³	
Inhalation	Local effects Acute	-other toxicological threshold 0.2mg/m³	
Dermal	Systemic effects Long-term	-DNEL (Derived No Effect Level) 0.00414mg/kg bw/day	
Dermal	Systemic effects Acute	-no-threshold effect and/or no dose-response information available	
Dermal	Local effects Long-term	-no hazard identified	
Dermal	Local effects Acute	-no-threshold effect and/or no dose-response information available	
Eyes	Local effects	no hazard identified	

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Hazard assessment conclusion for the environment: PNECs

Compartment	Hazard conclusion	Remarks/Justification
Freshwater	PNEC aqua (freshwater): 0,455mg/l Intermittent releases:	Assessment factor: 2 Extrapolation method: sensitivity distribution PNEC aqua (freshwater) An assessment factor (AF) of between 5 and 1 are recommended to apply to the endpoint derived from the Species Sensitivity Distributions (SSDs) method. Consequently, an AF of 2 has been applied. Full justification has been provided below.
Marine water	PNEC aqua (marine water): 0,0055mg/l Intermittent releases:	Assessment factor: 100 Extrapolation method: assessment factor PNEC aqua (marine water) The lowest long term toxicity endpoint observed from the three freshwater or saltwater species representatives covering three trophic levels (algae, crustaceans [invertebrates] and fish) has been used. This lowest endpoint is observed for fish with a NOEC (65 d) = 0.55 mg Mn/L An assessment factor of 100 is applied to the lowest long-term results (e.g., EC_{10} or NOEC) from three freshwater or saltwater species representatives of three trophic levels (algae, crustaceans [invertebrates] and fish). Note that a number of studies for each trophic level are available and so the AF represents a worst-case.
Sediments (freshwater)	PNEC sediment (freshwater): 0,578mg/kg sediment dw	Assessment factor: 10 Extrapolation method: assessment factor PNEC sediment (freshwater) Only one reliable long term freshwater sediment test is available. EC_{10} = 16.34 mg Mn/L EC_{10} (54 d) = 16.34 mg Mn/L (which is equivalent to 12.569 mg Mn/kg wwt, assuming the sediment density of 1.3 g/cm^3).

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		Further, using the wet weight to dry weight conversion factor for sediment (i.e., 4.6), EC_{10} (54 d) = 57.818 mg Mn/kg dwt. An assessment factor of 100 is applied when data from one long term freshwater sediment test (NOEC or EC_{10}) is available.
Sediments (marine water)	PNEC sediment (marine water): 0,0578mg/kg sediment dw	Assessment factor: 1000 Extrapolation method: assessment factor PNEC sediment (marine water) Only one reliable long term freshwater sediment test is available. EC_{10} = 16.34 mg Mn/L EC_{10} (54 d) = 16.34 mg Mn/L (which is equivalent to 12.569 mg Mn/kg wwt, assuming the sediment density of 1.3 g/cm3). Further, using the wet weight to dry weight conversion factor for sediment (i.e., 4.6), EC_{10} (54 d) = 57.818 mg Mn/kg dwt An assessment factor of 1000 is applied when data from one long term freshwater sediment test (NOEC or EC_{10}) is available.
Sewage treatment plant	PNEC STP: 20,397mg/l	Assessment factor: 10 Extrapolation method: assessment factor PNEC STP NOEC (3 h) = 560 mg $MnSO_4$/L (equivalent to 203.97 mg Mn/L when a MW correction is made) When a NOEC derived from an activated sludge respiration inhibition test is available, an assessment factor of 10 is applied.
Soil	PNEC soil: 14,58mg/kg soil dw	Assessment factor: 10 Extrapolation method: assessment factor PNEC soil

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		The lowest long term toxicity endpoint after organic matter content correction from the three species of at least three trophic levels (e.g., plants, earthworm, microorganisms, arthropods) is observed for soil microorganism, which is NOEC (28 h) = 145.80 mg Mn/kg dwt (corrected for organic matter content). NOEC (28 h) = 207 mg Mn/kg dwt (which is equivalent to 145.80 mg Mn/kg dwt when corrected for organic matter content of 4.827 %). When long-term toxicity tests for three species of three trophic levels are available, AF of 10 is used.
Air	no hazard identified:	
Secondary poisoning	no potential for bioaccumulation:	Bioaccumulation of Mn is not expected to occur. Hence no secondary poisoning risk exists.

8.1.5 Control banding: A control banding approach is not used to decrease risk management measure during the use of this substance for the uses specified in section 1.2

2. **Exposure controls:** See Exposure scenarios in Annex 1

8.2.1 Appropriate engineering controls: Dust is trapped and recycled where possible. Waste water is collected for treatment and recycled. LEV is encouraged. Amend as per your company's procedures

8.2.2 Individual protective measures: Overalls, goggles and masks are mandatory during use.

8.2.2.1 Other non-personal protection: Good industrial hygiene is a must. Keep and use in well ventilated areas. See section 5 for more information Amend as per your company's procedures

8.2.2.2 CEN stand requirement for protective equipment: (Please state the quality/standard/thickness of the personal protective equipment used by your organisation)

a) Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. Complete as per your company procedures

b) Skin protection: Overalls, gloves and boots are not mandatory; however, they are encouraged for good industrial hygiene. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. (Please specify type of overall, gloves, boots including the thickness of material and amend as per your company procedures)

c) Respiratory protection: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.

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Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. (Amend as per your company procedures)

d) Thermal hazards: Not applicable

8.2.3 Environmental exposure controls: The substance is not harmful to the environment. (Please include environmental controls employed by your company)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES [the information below is based on available literature and studies]

9.1 General information	
State	Solid
Appearance	Metallic silver
Odour	Odourless
Melting point (Mpt) / Freezing point	>723 K (>450°C), Regulation (EC) No. 440/2008, Annex, A1
Boiling point or initial boiling point/boiling range	Melting pt >300°C, hence study not applicable
Flammability of solids	Not highly flammable, Regulation (EC) No. 440/2008, Method A10
Lower and upper explosion limit	Not applicable to solids
Flash Point	Not required for inorganic substances
Auto-ignition temperature	Not applicable to solids
Decomposition temperature	Not applicable to inorganic solids
pH	Include if known (where the substance is a solid, the pH of an aqueous solution at a given concentration shall be indicated)
Kinematic viscosity	Not applicable to solids
Solubility	Insoluble: 7.0 x 10-4 g/L, Regulation (EC) No. 440/2008, Annex A6
Partition Coefficient	Not applicable for inorganic substances
Vapour pressure	Study not conducted as Mpt >300°C
Density/Relative density	7.40 at 19°C, Regulation (EC) No. 440/2008, Annex, A3
Relative Vapour density	Not applicable to solids
Particle characteristics	PSD < 1mm in diameter
9.2 Other information	None
9.2.1 Physical hazard classes	
Explosives properties	Non explosive
Flammable gases	Not applicable as the substance is a solid
Aerosols	Not applicable under normal conditions of use
Oxidizing gases	Not applicable as the substance is a solid
Gases under pressure	Not applicable as the substance is a solid
Flammability of liquids/Solids	Not flammable
Self-reactive substances and mixtures	Not self-reactive
Pyrophoric liquids	Not applicable as the substance is a solid
Pyrophoric solids	Does not have pyrophoric properties
Self-heating substances and mixtures	Spontaneous ignition does not occur
Substances and mixtures which emit flammable gases in contact with water	Predicted not to emit flammable gases upon contact with water

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Oxidising Liquids/solids	Non oxidising, Method A17
Organic peroxides	Not applicable to inorganic substances
Corrosive to metals	The substance is not corrosive to metals
Bulk density	7.2 – 7.4 g/m3
9.2.2 Other information	No additional information relevant to the safe use of the substance

SECTION 10: STABILITY AND REACTIVITY [Amend information below to conform to your company information]

1. **Reactivity:** No specific test data related to reactivity available for this substance.
1. **Reactivity hazard of substance:** Not applicable for inorganic substances
2. **Reactivity hazard of mixture:** Not applicable as the substance is not a mixture
2. **Chemical stability:** The substance is chemically stable under recommended conditions of storage, use and temperature.
3. **Possibility of hazardous reaction:** No hazardous reaction when handled and stored according to provisions.
4. **Conditions to avoid:** Fine dust clouds may form explosive mixtures with air. Avoid dust generation and contact with acids Include your company's information
5. **Incompatible materials:** Reactive or incompatible with the following materials: oxidizing materials, acids, and moisture**.** Include your company's information

10.6 Hazardous decomposition products: Does not decompose when used for intended uses. Include your company's information

SECTION 11: TOXICOLOGICAL INFORMATION [The information in this section is from experimental data and other available literature]

1. **Information on toxicological effects:**

a. **Acute toxicity:** Based on available data, the classification criteria are not met

Acute oral toxicity: No adverse effect observed (LD50 >2000 mg/kg bw)
Acute dermal toxicity: No study available. No concerns predicted
Acute inhalation toxicity: No adverse effects observed (LD50 >5000 mg/m3)

b. **Skin corrosion/irritation:** Based on available data, the classification criteria are not met

Not irritating in rabbits (one study according to OECD guideline 404 and EU method B.4, GLP), applied to the intact skin for 24 hours and 72 hours post dosing. Primary dermal irritation index for all animals = 0. No effects were noted during the study.

c. **Serious eye damage/irritation:** Based on available data, the classification criteria are not met

Not irritating in the rabbit (one study according to OECD guideline 405 and EU method B. 5, GLP); undiluted test material applied to the right eye of three animals. Cornea score: 0 of Max 4; Iris score: 0 of max 2 and Chemosis score: 1 of max 4. Fully reversible within 72hrs.

d. **Respiratory or skin sensitization:** Based on available data, the classification criteria are not met

Not a skin sensitizer in the mouse (One study to OECD guideline 429 and EU method B.42, Local lymph node assay, GLP). There is not information available for respiratory sensitization. However, it is predicted not to be a respiratory sensitizer.

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

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Data lacking for the substance as such. However, data on MnCl2 – a very soluble salt considered as a worse-case evaluation concludes – no effects:

- Ames test with S. typhimurium TA 98, TA 100, TA 1535, TA 1537, E coli WP2 uvrA (Met. act.: with and without) (OECD TG 471, EU method B13 and GLP); No toxicity was observed up a concentration of 5000 ug/plate.
- Mammalian cell gene mutation assay with mouse lymphoma L5178Y cells (met. act.: with and without) (OECD 476 and GLP); Negative for mouse lymphoma Cytoxicity: Yes, induced toxicity was not at the highest dose.
- In-vitro mammalian chromosome aberration test with human lymphocytes (Met. act.: with and without) (OECD guideline 473 and GLP). Negative for lymphocytes. Cytotoxicity: Yes

f. **Carcinogenicity:** Based on available data, the classification criteria are not met
There are no specific studies on carcinogenicity for this substance – data lacking. However, a literature review on carcinogenicity for Mn and its inorganic compounds (Assem et al, 2011) concluded – No concerns, carcinogenicity in humans is not expected. This is supported by the EU SCOEL review outcome.

g. **Reproductive toxicity:** Based on available data, the classification criteria are not met
An extended one generation study is not available for this substance. However, a two generation reprotoxicity study on the male/female rats using MnCL2 via inhalation (OECD guideline 416, GLP) concluded: No treatment related effects at 20 mg/m³ air in F0, F1 and F2 generations (Jardine L, 2013 and McGough & Jardine, 2017) - Not toxic to reproduction.
A prenatal-developmental toxicity study using MnCl2 via inhalation (OECD 414, GLP) concluded: No fetal abnormalities at 15 mg/m³ (Dettwiler M, 2016) – No effects reported.

h. **Specific target organ toxicity (Single exposure):**

Based on available data the classification criteria are not met.

i. **Specific target organ toxicity (repeated exposure):**

Based on available data (90 days chronic inhalation study) the classification criteria are not met. However, some epidemiological studies from some manganese-based smelters have highlighted the possibility of adverse health effects via repeated, long-term inhalation of dust in excess of mandatory exposure limits. However, the metal at zero valency has no data demonstrating such toxicity outside lung irritation from overload upon inhalation exposure.

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

2. **Information on other hazard**

1. **Endocrine disrupting properties:** The substance is not considered an endocrine disruptor based on available literature and invitro studies.

SECTION 12: ECOLOGICAL INFORMATION

1. **Toxicity:**

Acute toxicity to aquatic organisms: Based on available data, the classification criteria are not met
Current OECD and GLP ecotoxicity studies on the ingredients/constituents showed negative results. An acute daphnia study (OECD guideline 202, EU method C2 and GLP. EC50/LC50 (48h) for freshwater invertebrates) on the preparation (FeMn) resulted in an EC50 >42mg of alloy/L.
Long-term (chronic) toxicity to aquatic organisms: Based on available data, the classification criteria are not met
Toxicity to soil micro and microorganisms: Based on available data, the classification criteria are not met
Toxicity to other environmentally relevant organisms: (birds, bees and plants): Based on available data, the classification criteria are not met

2. **Persistence and degradation:** The substance does not have the potential for persistence.

3. **Bioaccumulation potential:** The substance does not have the potential to bioaccumulate.

4. **Mobility in soil:** Insignificant solubility in water, immobile

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5. **Results of PBT and vPvB assessment:** Results of PBT, vPvB, PMT, vPvM assessment: Not PBT, vPvB, PMT and vPvM based on knowledge of the constituent substances.

6. **Endocrine disrupting properties:** The substance is not considered an endocrine disruptor based on available literature and invitro studies.

12.7 Other adverse effects: The product is an inorganic metallic alloy with no ozone layer depletion potential. Include your company's information

SECTION 13: DISPOSAL CONSIDERATIONS Include your company's information

13.1 Waste treatment methods: Recycle when possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. The product is not hazardous, and waste may be disposed of by landfill.

13.1.1 Physical/chemical properties that affect waste treatment options: Generally, solid waste should be separated and reused. Recycling is encouraged.

13.1.2 Sewage disposal: Sewage disposal is discouraged. Include other information based on your company's procedures.

13.1.3 Precautions for recommended waste treatment options: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers

13.1.4 Other relevant provisions related to waste: Handle contaminated packages in the same way as the product itself. Include other information based on your company's procedures as well as national laws.

SECTION 14: TRANSPORT INFORMATION

Transport may take place according to national regulations or land transport (ADR/RID), sea transport (IMDG) or Air transport (ICAO-TI/IATA-DGR).

14.1 UN Number: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.2 UN proper shipping name: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.3 Transport hazard class: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.4 Packaging group: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.5 Environmental hazard: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.6 Special precautions for users: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.7 Transport in bulk according to Annex II of MARPOL73/78 and ISBC code: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

SECTION 15: REGULATORY INFORMATION [Delete as appropriate and include regulatory information specific to your country...]

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture	No labelling is required. UN GHS - UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS): According to Chapter 1.5.2 of the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS) safety data sheets (SDS) are only required for substances and mixtures that meet the harmonized criteria for physical, health or environmental hazards. This substance does not meet this criterion. However, the information provided in this document is to meet corporate social responsibility standards.

11 rue Dulong – 75017 Paris - France
Tel : +33 (0) 1 45 63 06 34 Fax : +33 (0) 1 42 89 42 92
E-mail : reach@manganese.org - Web site : www.reach-manganese.org

	EU CLP – Classification Labeling and Packaging Regulation: According to Article 59(2)(b) of (EC) No 1272/2008 (CLP), which amends REACH article 31(1), safety data sheets (SDS) are only required for substances and mixtures/special preparations that meet the harmonised criteria for physical, health or environmental hazards. This substance does not meet this criterion. However, the information provided in this document is to meet our corporate social responsibility standards. EU REACH – Registration, Evaluation and Authorisation of Chemicals: REACH article 31(7) requires relevant exposure scenarios from the Chemical Safety Report (CSR) to be annexed to the SDS. These exposure scenarios are only required for hazard-classified substances or mixtures. This substance is not hazard-classified according to CLP, therefore exposure scenarios are not required.
15.2 Chemical Safety Assessment	No chemical safety assessment has been carried out because the substance is not classified as hazardous. Exposure scenarios are not mandatory

SECTION 16: OTHER INFORMATION

a. Updated sections	Main changes: 1.1 UFI, 1.3 details of supplier of safety substance information, 2.1 hazard identification, 2.3 Other hazards, 3.1 substances and impurities,4 first aid measures, 5.3 advice for fire fighters, 7.1 precaution for safe handling, 7.2 conditions for safe storage including incompatibility, 8.1.1 OELs, 8.1.1.1 national occupational exposure limits, 8.1.4 DNELs & PNECs, 8.2.2.2 CEN stand requirements for protective equipment, 9.1 general information, 10.1 Reactivity, 10.4 conditions to avoid, 10.5 incompatible material, 11 toxicological information, 12 ecological information; 12.1 toxicity, 12.7 other adverse effects, 13.1 waste treatment methods, 14, transport information, 16 other information Editorial changes throughout the document.
b. A key/legend to abbreviations and acronyms used in the SDS should be added in this section	ADN – European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road BCF – Bioconcentration Factor CAS – Chemical Abstract Service CL – Concentration limits CLP – Classification, Labelling and Packaging Regulation (EC) No. 1272/2008 DMEL – Derived Minimal Effect Level DNEL – Derived No Effect Level EC – European Commission ED – Endocrine Disruption EL50 – Half maximal effect loading rate (Loading rate halfway between the maximum and baseline of an effect) EC50 – Half maximal effect concentration (Concentration halfway between the maximum and baseline of an effect)

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	ErC50 – Half maximal effect concentration growth rate (Concentration halfway between the maximum and baseline of an effect) ECHA – European Chemicals Agency GHS – Globally Harmonized System of Classification and Labelling of Chemicals IATA – International Air Transport Association IBC – Intermediate Bulk Carrier IMDG – International Maritime Dangerous Good LC50 – Median lethal concentration (Concentration which causes 50 % mortality of the test population) LD50 – Median lethal dose (Dose which causes 50 % mortality of the test population) LL50 – Median Lethal Load (Dose which causes 50 % mortality of the test population) MARPOL – International Convention for the Prevention of Pollution from Ships NOAEL – No Observed Adverse Effect Level NOEL – No Observed Effect Level OEL – Occupational Exposure Limit PNEC – Predicted No Effect Concentration PBT – Persistent, Bioaccumulative, Toxic REACH – Registration, Evaluation, Authorisation, and restriction of Chemicals - Regulation (EC) No. 1907/2006 STOT – Specific Target Organ Toxicity TWA – Time Weighted Average vPvB – Very Persistent and Very Bioaccumulative
c. Literature references and sources of data	IFA: GESTIS - International limit values for chemical agents https://chem.echa.europa.eu/100.028.277/dossier-list/reach/dossiers/active?searchText=manganese https://chem.echa.europa.eu/100.028.270/dossier-list/reach/dossiers/active?searchText=iron https://echa.europa.eu/registration-dossier/-/registered-dossier/16144/6/1
d. Classification derivation	The classification of the product is based on the classification of the constituent substances.
e. Precautionary notes	During melting, pickling and welding stages (strongly oxidizing conditions), water soluble hexavalent manganese and oxides of metals may be present in the effluent fumes. Suitable precautions should be taken to minimize exposure of personnel to such fumes. Any moisture in the material should be regarded as an explosion hazard if it is to be used in high temperature environment.
f. Disclaimer	This product does not meet the EU Regulation No. 1907/2006 requirements for a mandatory safety data sheet. This safety information sheet is therefore issued voluntarily as a corporate social responsibility act for safe handling. It acts as a template for MARA members. To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability whatsoever for the accuracy and completeness of such information.
For more information contact	reach@manganese.org

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Tel : +33 (0) 1 45 63 06 34 Fax : +33 (0) 1 42 89 42 92
E-mail : reach@manganese.org - Web site : www.reach-manganese.org