
SAFETY DATA SHEET: SLAGS, FERROMANGANESE-MANUFG
Provided in accordance with Article 18(2) of Regulation (EC) No 1272/2008

SECTION 1: IDENTIFICATION

1.1 Product identifier:
Substance name: Ferromanganese slag
Other names: FeMn slag
EC No.: 273-728-1
CAS No.: 69012-28-8
REACH Registration number: **[If applicable]**
Unique formula identifier (UFI): Not applicable for this substance

1.2 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 as well as other metallic products.
SU 19: Building and construction work, PC0
SU14: Manufacture of Basic Metals including alloys: Intermediate in the manufacture of FeSiMn alloys, PC7
Add or delete the above to suit your company's needs
No known uses advised against

1.3 Details of the supplier of the safety data sheet:
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.

1.4 Emergency Telephone: Complete as required (For EU include 112); CIAV # of receiving country

SECTION 2: HAZARD(S) IDENTIFICATION

2.1 Classification of the substance or mixture:
Classification according to Regulation (EC) No. 1272/2008 [EU CLP] and the UN GHS: Classified as Repro Cat 2: Suspected of damaging fertility or the unborn child – route of exposure – oral route.

2.2 Labelling elements:

Classification:	Repr Cat 2
Pictogram	
Signal word	Warning

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

Hazard statement	H361d: Suspected of damaging fertility or the unborn child.
Precautionary statement Prevention	P201, P202, P280
Precautionary statement Response	P308+P313 IF exposed or concerned: Get medical advice/attention.

2.3 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)

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.

Oxides of corresponding metals 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) [Amend as appropriate]

FeMn slag is an inorganic UVCB substance. Therefore, the concentration of its components is variable based on its source material and impurities cannot be meaningfully identified.

Chemical name	EC No.	CAS number	Concentration % w/w	REACH Registration No. Not applicable as substance is a UVCB
Magnesium Oxide	215-171-9	1309-48-4	Complete as per your substance	-
Aluminium oxide	215-691-6	1344-28-1	Complete as per your substance	-
Silicon dioxide	231-545-4	7631-86-9	Complete as per your substance	-
Calcium oxide	215-138-9	1305-78-8	Complete as per your substance	-
Barium Oxide	215-127-9	1304-28-5	Complete as per your substance	-
Manganese	231-105-1	7439-96-5	Complete as per your substance	-
Manganese oxide	215-695-8	7440-21-3	Complete as per your substance	-

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

Iron	231-096-4	7439-89-6	Complete as per your substance	-
Additional information: H-statement H361d: Suspected of damaging fertility or the unborn child.				

3.2 Mixtures: The substance is not considered a mixture according to the EU CLP**.**

SECTION 4: FIRST AID MEASURES

4.1 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)

- **4.1.1 General information:** In the event of accidental exposure leading to unwellness, seek medical advice immediately.
- **4.1.2 Following inhalation:** Do not inhale. Wear an appropriate mask. Include other relevant information based on your company's procedures.
- **4.1.3 Following skin contact:** Include information based on your company's procedures.
- **4.1.4 Following eye contact:** Include information based on your company's procedures.
- **4.1.5 Following ingestion:** Include other relevant information based on your company's procedures.
- **4.1.6 Self-protection of the first aider:** Include information based on your company's procedures.

4.2 Most important symptoms and effects, both acute and delayed: Dust particles may cause physical effects on eyes and lungs leading to itchiness and coughing: Breathing difficulties may occur immediately in the event of excessive dustiness due to lung overload.
Include any useful/relevant information.

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

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media: Ferromanganese slag is not combustible Include information on appropriate extinguishing media and detail any unsuitable extinguishing media based on your company's procedures.

5.2 Special hazards arising from the substance or mixture: Not combustible under normal conditions of use. Irritating or toxic gases may be generated by thermal decomposition of the substance Metallic dust or powder may form an explosive mixture with air. Include any other relevant information.

5.3 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:

6.1 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.

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

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.

6.2 Environmental precautions: The substance is not considered an environmental hazard based on the available studies. However, it is advisable to keep away from drains/waterways as large quantities could clog drains. Recycling is possible and encouraged. Include other information based on your company's procedures

6.3 Methods and material for containment and cleaning up: In the event of a spill, collect contaminated material and put in appropriate containers for disposal. Dispose of as special waste in compliance with local and national regulations

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. Amend as per your company's procedures – include cleaning and vacuuming techniques.

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

6.4 Reference to other sections

For personal protective equipment and appropriate disposal: see section 8 and 13

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

7.1.1 Recommendations:

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 could be carried out in properly ventilated area and wear 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 procedure

7.1.2 Advice on general occupational hygiene:

a) Do not eat, drink or smoke in work area.
b) Wash hands before and after use and keep them dry.
c) Remove contaminated clothing and PPE 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 associated with physical and chemical properties

i) Explosive atmosphere: The substance is not explosive; however, stored away from potential 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

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

c) not affect the integrity of the substance. However, storage environments should not be humid-Amend as per your company's procedure.
d) How to maintain the integrity of the substance: (i) Stabilisers and (ii) antioxidants are not required. The substance is very stable under normal conditions of use. It does not decompose or disintegrate.
e) 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. Amend as per your company's procedures.
ii) Specific designs for storage: Keep/store only in original containers/packaging. Can be stored in bulk in stacks. Keep substance dry, especially if used in high temperature applications in contact with molten metal. –Include other information based on company's procedure
iii) Quantity limits under storage conditions: There is no limitation as the substance does not pose any physical or chemical hazard.
iv) Packaging compatibility: Store in original/similar packaging or can be stored in bulk in stacks. Protect container/packaging against damage. -Amend as per company's procedure.

7.3 Specific end use(s):

The substance is used as raw material for the manufacture of steel and other metallic products/articles that are generally recycled at end of life. Observe instructions for safe use Observe instructions for use and see exposure scenarios – Annex 1

SECTION 8: EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters:

8.1.1 Occupational exposure limits: The EU SCOEL OEL values for Manganese and its inorganic compounds of 0.2mg/m3 – inhalable and 0.05mg/m3 respirable

8.1.1.1 National occupational exposure limits – Europe: 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 countries' specific workplace limits.

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

8.1.1.3 Any other national limit values: Include if available.

8.1.1.4 Union biological limit values: No union biological limits values exist for inorganic manganese.

8.1.1.5 Any other national biological values: Include if available.

8.1.2 Monitoring procedures: In accordance with Directives 80/1107/EEC and 88/642/EEC. No specific recommendations. Dust monitoring is recommended, provide methodology as per national laws/company procedures.

8.1.3 Formation of air contaminants: The substance does not produce air contaminants under normal conditions of use. 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) 0.27mg/m³	developmental toxicity / teratogenicity (Oral)
Inhalation	Systemic effects - Acute	no hazard identified.	

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

Inhalation	Local effects - Long-term	no hazard identified.	
Inhalation	Local effects - Acute	no hazard identified.	
Dermal	Systemic effects - Long-term	DNEL (Derived No Effect Level) 0.08mg/kg bw/day	developmental toxicity / teratogenicity (Oral)
Dermal	Systemic effects - Acute	no hazard identified.	
Dermal	Local effects - Long-term	no hazard identified.	
Dermal	Local effects - Acute	no hazard identified.	
Eyes	Local effects	no hazard identified.	

Hazard assessment conclusion for the environmental: PNECs

Compartment	Hazard conclusion	Remarks/Justification
Freshwater	PNEC aqua (freshwater): 0.064mg/L Intermittent releases: 0.32mg/L	Assessment factor: 50 Extrapolation method: assessment factor PNEC aqua (freshwater) Two chronic NOEC values in algae and Daphnia. NOEC = 3.2 mg/L **PNEC intermittent release hazard assessment conclusion:** PNEC aqua (intermittent releases) **PNEC intermittent release assessment factor:** 100.0 **PNEC intermittent release extrapolation method:** assessment factor **PNEC intermittent release justification:** Lowest L(E)C50 value from fish, daphnia and algal studies. EyC50 = 32 mg/L
Marine water	PNEC aqua (marine water): 0.006mg/L Intermittent releases:	Assessment factor: 500 Extrapolation method: assessment factor PNEC aqua (marine water) Two chronic NOEC values in algae and Daphnia, with further 10 x factor for freshwater to marine. NOEC = 3.2 mg/L

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

Sediments (freshwater)	PNEC sediment (freshwater): 6.38mg/kg sediment dw	Assessment factor: 500 Extrapolation method: assessment factor PNEC sediment (freshwater) Equilibrium partitioning based on freshwater aquatic PNEC and Kd value of 994 mL/g and application of an additional safety factor for ingestion of material bound to sediment.
Sediments (marine water)	PNEC sediment (marine water): 0.64mg/kg sediment dw	Assessment factor: 5000 Extrapolation method: assessment factor PNEC sediment (marine water) Equilibrium partitioning based on marine aquatic PNEC and Kd value of 994 mL/g and application of an additional safety factor for ingestion of material bound to sediment.
Sewage treatment plant	PNEC STP: 100mg/L	Assessment factor: 10 Extrapolation method: assessment factor PNEC STP Activated sludge Respiration/inhibition test. NOEC = 1000mg/L
Soil	PNEC soil: 6.36mg/kg soil dw	Assessment factor: 50 Extrapolation method: assessment factor PNEC soil Equilibrium partitioning based on aquatic PNEC and Kd value of 994 mL/g and application of an additional safety factor for ingestion of material bound to sediment.
Air	No hazard identified	
Secondary poisoning	No potential for bioaccumulation	No bioaccumulation is expected due to the inorganic nature of the substance.

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

8.2 Exposure controls: See Exposure scenarios in Annex 1

8.2.1 Appropriate engineering controls: Dust is trapped; water is collected for treatment and recycled. Local exhaust ventilation (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

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

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 substance. (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. Respirator selection must be based on known or anticipated exposure levels, the hazards of the substance 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. However, avoid dust generation and do not wash spillages into drainage system as material may block drains. (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	Grey, green solid lumps
Odour	Odourless
Melting point (Mpt) / Freezing point	>723 K (>450°C), Regulation (EC) No. 440/2008, Annex, A1
Boiling point/boiling range	Melting pt >300°C, hence study not applicable
Flammability of solids	Not flammable, Regulation (EC) No. 440/2008, Method A10
Lower and upper explosion limits	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
Water Solubility	Poorly soluble (1.2 x 10-4 g/L): Regulation (EC) No. 440/2008, Annex A6
Partition Coefficient/ n_octanol/water	Not applicable for inorganic substances
Vapour pressure	Study not conducted as Mpt >300°C
Density/Relative density	3.43 at 23°C, Regulation (EC) No. 440/2008, Annex, A3
Particle characteristics	The proportion of test material having an inhalable particle size less than 100 µm was below 3.3 % w/w, OECD 110
9.2 Other information	None
9.2.1 Physical hazard classes	
Explosive properties	Predicted to be 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

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

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
Oxidising Liquids/solids	Non oxidising, Method A17
Organic peroxides	Not applicable to inorganic substances
Corrosive to metals	The substance is not corrosive to metals
Desensitised explosives	Not applicable
Bulk density	Data lacking
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]

10.1 Reactivity: The substance does not contain reactive functionalities.
10.1.1 **Reactivity hazard of substance:** Not applicable for inorganic substances
10.1.2 **Reactivity hazard of mixture:** Not applicable as the substance is not a mixture.

10.2 Chemical stability: The substance is chemically stable under recommended conditions of storage, use and temperature.

10.3 Possibility of hazardous reaction: No hazardous reaction when handled and stored according to provisions.

10.4 Conditions to avoid: Fine dust clouds may form explosive mixtures with air. Avoid dust generation and contact with acids Include information based on your company's procedures.

10.5 Materials to avoid: Reactive or incompatible with the following materials: oxidizing materials, acids, and moisture. Include other information based on your company's procedures.

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

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

11.1 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 adverse effects observed (LD50> 2000mg/kg bw)
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
Slightly irritating to the rabbit's eye (one study according to OECD guideline 405 and EU method B. 5, GLP); undiluted test material applied to the right eye of three animals. Maximum mean total score of 10 of max. Not classified under GHS. Fully reversible effects within 48hrs.
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
Data lacking for the substance as such. However, data on $MnCl_2$ – 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.

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

- 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 rabbit data, the classification criteria are met for prenatal toxicity
An extended one generation study is not available for this substance. However, a two-generation reproductive toxicity 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.
NOEL: 1000mg/kg/bw - Prenatal developmental study (PND) in the rat, to GLP – no effects reported
NOAEL: less than 100mg/kg/day - Prenatal developmental study (PND) in the rabbit, to GLP – effects seen, hence the classification in section 1.2.
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, the classification criteria are not met
Based on available data on analogue substance SiMn slag (subchronic 90 days 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 exposure limits.
j) Aspiration hazard: Based on available data, the classification criteria are not met

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties: The substance is not considered an endocrine disruptor based on available literature - data lacking.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity: No environmental concerns

Acute toxicity to aquatic organisms: Based on available data, the classification criteria are not met

a) Fish: OECD guideline 203, EU method C1 and GLP. LD50 (96h) for freshwater fish: >100 mg/L; NOEC 100 mg/L

Crustacean: OECD guideline 202, EU method C2 and GLP. EC50/LC50 (48h) for freshwater invertebrates: 43 mg/L: NOEC 32mg/L

b) Algae/aquatic plants: OECD 201, EU method C3 and GLP. EC50/LC50 (72h): >90 mg/L. NOEC (72h): 10 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. EL50 6.5-20 mg/L; LOEC (8d): 10 mg/L.

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

12.2 Persistence and degradability: Not persistent based on knowledge of the constituent substances

12.3 Bioaccumulative potential: Not bioaccumulative based on knowledge of the constituent substances

12.4 Mobility in soil: Insignificant solubility in water, immobile

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

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

12.6 Endocrine disrupting properties: No endocrine disrupting properties based on knowledge of the constituent substances

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

SECTION 13: DISPOSAL CONSIDERATIONS Include other information based on your company's procedures.

13.1 Waste treatment methods: Recycle when possible. Disposal of this substance, 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 substance 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 substance 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	labelling is required, see section 1.2 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 meet this criterion. EU CLP – Classification Labelling and Packaging Regulation: According to Article 59(2)(b) of (EC) No 1272/2008 (CLP), which amends REACH article 31(1), safety data sheets

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

	(SDS) are only required for substances and mixtures/special preparations that meet the harmonised criteria for physical, health or environmental hazards. This substance does meet this criterion. 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 hazard-classified according to CLP, therefore exposure scenarios are required.
15.2 Chemical Safety Assessment	A chemical safety assessment has been carried out because the substance is classified as hazardous – repro Cat 2. Exposure scenarios are mandatory and available

SECTION 16: OTHER INFORMATION		
a)	Updated sections	Main changes: 1.1 UFI, 2.3 Other hazards, 8.2 Exposure controls, 12 ecological information; 13.1 waste treatment methods, 14 Transport, 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) 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)

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

		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/100.067.006/dossier-list/reach/dossiers/active?searchText=273-728-1
d)	Classification derivation	The classification of the substance is based on available data on the substance itself and its analogues
e)	Precautionary notes	During melting, pickling and welding stages (strongly oxidizing conditions), 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 substance meets the EU Regulation No. 1907/2006 requirements for a mandatory safety data sheet. This SDS 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

ANNEX 1: EXPOSURE SCENERIOS (Include ES)