



# MATERIAL SAFETY DATA SHEET

for

## Ferrosilicomanganese (FeSiMn)

prepared according to Annex II of Regulation EP and Council  
(1907/2006/EC and Commission Regulations (EU) 2020/878)

Number: KBU-002-EN

Release date:

01/12/2024

Revision No: 0

Revision Date:-

### 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1 Product identifier

**Trade name:** FeSiMn  
**Chemical name:** Ferrosilicomanganese  
**Synonyms:** SiMn, Silicomanganese

Ingredient	EC number	CAS number	REACH registration number	Index number
Manganese (Mn)	231-105-1	7439-96-5	01-2119449803-34-XXXX	not applicable
Iron (Fe)	231-096-4	7439-89-6	01-2119462838-24-XXXX	not applicable
Silicon (Si)	231-130-8	7440-21-3	01-2119480401-47-XXXX	not applicable

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

##### Relevant identified uses:

- as a complex deoxygenation and alloying agent,
- in the silicothermic process of producing LC FeMn,
- in steel production.

**Non-recommended uses:** Information is not available.

#### 1.3 Details of the supplier of the Safety Data Sheet

**Manufacturer:** OFZ as  
**Address:** Široká 381, 027 41 Oravský Podzámok, Slovakia  
**Phone number:** +421/43/5804 111  
**Fax number:** +421/43/5804 320  
**E-mail:** ofz@ofz.sk

#### 1.4 Emergency telephone number

FeSiMn is not hazardous, emergency call numbers are not required.  
However, in the event of an accident, call the local emergency line.

European emergency tel. number: 112

National Toxicological

Information Center: +421 2 5477 4166 (24-hour consultation service)

OFZ, a. s., Široká 381, 027 41 Oravský Podzámok, Slovakia

Telephone

+421 43 5804 111

Fax

+421 43 5804 320

Bank Account

SK431100000002621706224

Reg. No.

36 389 030

VAT No.

SK 2020131476

e-mail

ofz@ofz.sk

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## 2. HAZARD IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### 2.1.1 Classification according to Regulation (EC) No. 1272/2008 (CLP)

Not classified.

#### 2.1.2 Additional information

Information is not available.

### 2.2 Label elements

Labeling is not required.

### 2.3 Other hazards

FeSiMn is **not** classified as a PBT (persistent, bioaccumulative, and toxic) substance or a vPvB (very persistent and very bioaccumulative) substance according to the criteria set out in Annex VIII of the REACH regulation.

FeSiMn **does not** contain substances listed in the inventory compiled in accordance with Article 59(1) of the REACH regulation that have endocrine-disrupting properties, nor are they identified as substances with endocrine-disrupting properties according to the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration of 0.1% or higher.

FeSiMn is **not** classified as hazardous under the CLP regulation (1272/2008/EC). Available literature on long-term exposure at high concentrations indicates neurotoxic effects.

When handling FeSiMn, always use appropriate protective equipment; eye protection and gloves when directly handling the material, and suitable respiratory protection in the presence of dust. If FeSiMn particles are dispersed, they may form explosive mixtures of dust and air.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Not applicable.

### 3.2 Mixtures

FeSiMn is an alloy of iron, silicon, and manganese.

It is considered a special preparation under EU REACH and as a mixture under EU CLP.

Ingredient	Typical concentration	Concentration range	Notes
Manganese (Mn)	min. 65 % (w/w)		
Iron (Fe)	12-17 % (w/w)		
Silicon (Si)	min. 14 % (w/w)		

It does not contain any impurities necessary for classification and labeling.

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## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

<u>General notes:</u>	In case of accidental exposure and symptoms of illness, seek medical attention immediately.
<u>After inhalation:</u>	Mechanical irritation caused by dust in the respiratory tract. Move the affected person to fresh air. If the affected person is not breathing, provide artificial respiration. In case of any discomfort, contact a doctor.
<u>After skin contact:</u>	Wash the skin with water or mild detergent.
<u>After contact with eyes:</u>	Rinse eyes with water or saline solution. If discomfort persists, seek medical treatment.
<u>After ingestion:</u>	Unlikely. However, in case of ingestion, do not induce vomiting and seek medical help immediately.

### 4.2 Most important symptoms and effects, both acute and delayed

Dust particles of FeSiMn can cause physical effects on the body.

Acute: irritation, changes in body temperature, nausea, vomiting, diarrhea and headache.

Chronic: irritation, loss of appetite, difficulty breathing, disorientation, difficulty speaking, sleep disorders, emotional disturbances, hallucinations, mood changes, tremors, muscle cramps, loss of coordination, hearing loss, vision disorders, lung damage, blood disorders, kidney damage, liver damage, nerve damage and cancer.

### 4.3 Indication of any need for immediate medical attention and special treatment needed

No relevant information identified. In case of doubt or when observing symptoms, seek medical assistance.

## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

FeSiMn is not flammable and its dust does not pose an explosion hazard.

**Suitable extinguishing media:** dry sand, CO<sub>2</sub> fire extinguisher or powder fire extinguisher

**Unsuitable extinguishing media:** Do not use extinguishing media containing water.

### 5.2 Special hazards arising from the substance or mixture

FeSiMn is not flammable and its dust does not pose an explosion hazard.

Wet material added to molten or hot FeSiMn can cause explosions.

A mixture of FeSiMn dust and air can ignite or explode.

During combustion, vapours of metal oxides and a mixture of carbon monoxide and carbon dioxide are produced.

When in contact with water or humid air, flammable and/or toxic gases may be generated.

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#### 5.3 Advice for firefighters

Use appropriate fire prevention measures considering local circumstances and environment.  
Avoid inhaling material or by-products of combustion. Use respiratory protection.  
Isolate the hazardous area and prohibit entry.

Do not extinguish molten FeSiMn with water.  
Wet material added to molten FeSiMn can cause an explosion.  
Dust and air mixtures can ignite or explode.  
Contact with water or humid air can produce flammable and/or toxic gases.

Allow the fire caused by molten FeSiMn to extinguish on its own. Do not interfere with the molten metal when extinguishing. Move the container from the fire area if it can be done without risk. Protect containers from mechanical damage and cool with a water spray until the fire is extinguished. Do not allow water to enter the containers.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

#### 6.1.1 For non-emergency personnel

Isolate the hazardous area and prevent entry.  
Keep unprotected persons at a safe distance.  
Wear appropriate protective equipment (see section 8).  
Ensure dust extraction and adequate ventilation.  
Remove all sources of ignition (do not smoke, create sparks, or flames in the hazardous area)  
In case of accidental release, leave the workplace and contact trained personnel.

#### 6.1.2 For emergency personnel

Isolate the hazardous area and prevent entry.  
Keep unprotected persons at a safe distance.  
Wear appropriate protective equipment (see section 8).  
Ensure dust extraction and adequate ventilation.  
Remove all sources of ignition (do not smoke, create sparks, or flames in the hazardous area).

### 6.2 Environmental precautions

Based on available studies, the substance does not pose a hazard to the environment.  
Prevent dispersion into the environment, and avoid material runoff into soil, watercourses, and sewage systems.

### 6.3 Methods and material for containment and cleaning up

#### 6.3.1 To prevent spread

Handle the material in a way that minimizes dust generation as much as possible.  
Prevent dust from being stirred up.  
Ensure ventilation and dust extraction.

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#### 6.3.2 For cleaning

Dust from FeSiMn should be collected in appropriate closed containers.

Prefer vacuuming over sweeping using a system that does not create ignition sources.

Thoroughly clean contaminated objects and surfaces in compliance with environmental regulations.

#### 6.3.3 Other information

Information is not available.

#### 6.4 Reference to other sections

Information on handling: see section 7.

Information on combustion products: see section 5.

Information on incompatible materials: see section 10.

Information on personal and environmental protection: see section 8, 12 and 13.

## 7. HANDLING AND STORAGE

#### 7.1 Precautions for safe handling

##### Safety measures:

Ensure adequate ventilation/extraction in the workplace.

Handle materials in a way that minimizes dust generation as much as possible.

Prevent the accumulation and raising of FeSiMn dust during handling.

Avoid the creation of sparks or other ignition sources in areas with high dust concentration.

Wear protective clothing, gloves and goggles.

Wear appropriate respirators. (see section 8).

Order and fire safety measures must be maintained in storage areas.

Wet material added to molten FeSiMn poses an explosion hazard.

##### Environmental protection measures:

Capture spilled FeSiMn dust in a closed container.

Prevent dispersion into the environment, and avoid material runoff into soil, watercourses, and sewage systems.

Dispose of in a way approved by the relevant local authorities.

##### General hygiene instructions in the workplace:

Do not eat, drink, or smoke while handling FeSiMn.

Wash thoroughly after handling.

Remove contaminated clothing and PPE before entering dining areas.

#### 7.2 Conditions for safe storage including any incompatibility

Store in a dry, well-ventilated place.

Store away from flammable and explosive materials, acids and bases, food and beverages.

Keep away from sources of ignition.

If FeSiMn is not protected from weather influences, slight discoloration of its surface may occur, which is non-toxic and does not degrade its properties and quality.

Order and fire safety measures must be maintained in storage areas.

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### Additional information on storage conditions

Information is not available.

### 7.3 Specific end use (s)

Information is not available.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

Users must always consult their national or regional regulatory authorities for advice on the current legal limits that apply to them. They should further check whether these limits are legally binding or merely recommended guidelines.

#### 8.1.1 Exposure limit values

##### Exposure limit values for manganese and its inorganic compounds

<b>OEL (SK)</b>	Mn: 0.2 mg/m <sup>3</sup> – inhalable fraction and 0.05 mg/m <sup>3</sup> respirable fraction
<b>OEL (EU)</b>	Mn: 0.2 mg/m <sup>3</sup> – inhalable fraction and 0.05 mg/m <sup>3</sup> respirable fraction
<b>Average NPEL</b>	Mn: 0.2 mg/m <sup>3</sup> – inhalable fraction and 0.05 mg/m <sup>3</sup> respirable fraction
<b>Biological limits</b>	Mn: no values exist

#### DNEL for workers: Predicted no-effect concentrations (PNEC):

Route of Entry	Effect Type	Hazard Limit	Most Sensitive Endpoint
inhalation	systemic effects - long-term	DNEL: 0.27 mg/m <sup>3</sup>	developmental toxicity /teratogenicity (oral)
inhalation	systemic effects - short-term	no hazard detected	
inhalation	local effects - long-term	no hazard detected	
inhalation	local effects - short-term	no hazard detected	
skin contact	systemic effects - long-term	DNEL: 0.0055 mg/kg bw/day	developmental toxicity /teratogenicity (oral)
skin contact	systemic effects - short-term	no hazard detected	
skin contact	local effects - long-term	no hazard detected	
skin contact	local effects - short-term	no hazard detected	
eye contact	local effects	no hazard detected	

#### PNEC:

Category	Hazard conclusion
Freshwater	Mn: 0.064 mg/l
Seawater	Mn: 0.006 mg/l
Sediment (freshwater)	Mn: 6.38 mg/kg in sediment dw
Sediment (seawater)	Mn: 0.64 mg/kg in sediment dw
Wastewater treatment plant	Mn: 100 mg/l
Soil	Mn: 6.36 mg/kg in soil dw
Atmosphere	Mn: no hazard detected
Secondary poisoning	Mn: no potential for bioaccumulation

Under normal conditions of use, the product does not produce contaminants to air.  
OEL/BLV are not provided.

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#### Control zone approach

The control zone approach is not used to reduce the level of risk management during the use of this material for the uses listed in section 1.2.

#### 8.2 Exposure controls

To control possible exposure, it is necessary to prevent the generation and dispersion of dust. The use of appropriate protective equipment is recommended. When FeSiMn dust is visibly swirling, occupational safety measures should be taken to prevent fine dust above 0.2 mg/m<sup>3</sup> from swirling in the workplace.

##### 8.2.1 Adequate technical control measures

Regularly measure the exposure limit value at the workplace. If dust is generated during material handling, use an extraction or ventilation system or other means to maintain airborne dust limits.

##### 8.2.2 Individual protective measures, such as personal protective equipment

###### 8.2.2.1 Information on the use of protective equipment

Personal protective equipment must correspond to good hygienic practice in the work environment and be in accordance with control measures, including technical control measures, ventilation and isolation.

###### 8.2.2.2 Equipment to provide adequate and appropriate protection

###### a) eye/face protection

Mandatory wearing of safety glasses.

###### b) skin protection

Hand protection: Mandatory wearing of gloves and use of hand protection cream.

Other skin protection: Mandatory wearing of protective clothing and footwear.

###### c) respiratory protection

Mandatory use of FFP 2 / N95 respirator.

###### d) thermal hazard

Information is not available.

##### 8.2.3 Environmental exposure controls

Dust emissions from a ventilation system or workplace must be controlled to ensure that they meet the requirements under environmental protection legislation.

Limit values for particulates (PM 2.5 and PM 10) in ambient air (Directive 1999/30/EC and subsequent amendments) must be implemented.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Property	Information
Physical state	solid (pieces)
Color	Silvery-greenish
Odour	odourless, odour threshold: not relevant
Melting/freezing point	>450°C, Regulation (EC) No. 440/2008, Annex, A1
Boiling point	not relevant (solid state with melting point > 300°C)
Flammability	not very flammable, Regulation (EC) No. 440/2008, Method A10
Lower and upper explosive limit	not relevant (not applicable to solids)
Flash point	not relevant (not applicable to solids)
Auto-ignition	not relevant
pH value	not relevant (material is solid at ambient temperature)
Kinematic viscosity	not relevant (material is solid at ambient temperature)
Solubility	not relevant
Dissociation constant	not relevant
Vapour pressure	not relevant (melting point > 300°C)
Density and/or relative density	relative density: 6.33 at 21 °C, Regulation (EC) No. 440/2008, Annex, A3
Relative vapour density	not relevant (only applicable to gases and liquids)
Bulk density	2.8-4.0 t/m <sup>3</sup>

### 9.2 Other information

#### 9.2.1 Information regarding physical hazard classes

No information available.

#### 9.2.2 Other safety characteristics

No information available.

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

FeSiMn is stable under normal conditions of use, storage and transportation.

### 10.2 Chemical stability

FeSiMn is a stable material under normal conditions.

### 10.3 Possibility of hazardous reactions

There is no danger of hazardous reactions if the material is handled and stored as directed.

### 10.4 Conditions to avoid

Avoid contact of melt with water. A violent explosion may occur when molten material comes into contact with water. FeSiMn in the supplied form is not capable of dust explosion, however, the enrichment of fine dust leads to a dust explosion hazard.

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#### 10.5 Incompatible materials

water, acids and bases, oxidizing agents

#### 10.6 Hazardous decomposition products

Metal oxide vapours may be released during melting.

Manganese decomposes slowly in cold water, rapidly on heating; converted by fluorine to di- and trifluoride; by chlorine to dichloride. When heated in nitrogen above 200 °C, manganese burns to form nitride. When powdered manganese is exposed to fluorine, the reaction proceeds with incandescence.

### 11. TOXICOLOGICAL INFORMATION

#### 11.1. Information on toxicological effects

FeSiMn is not classified as dangerous according to the CLP Regulation (1272/2008/EC) or as dangerous according to the Dangerous Substances Directive (67/548/EEC)

Hazardous property	Information
Acute toxicity	Based on the available data, the classification criteria are not met. FeSiMn: LD50 = 2750 mg/kg (oral)/7.14 mg/l air (inhalation), method: recalculation
Skin corrosion/skin irritation	Based on the available data, the classification criteria are not met
Serious eye damage/eye irritation	Based on the available data, the classification criteria are not met
Respiratory or skin sensitization	Based on the available data, the classification criteria are not met
Germ cell mutagenicity	Based on the available data, the classification criteria are not met
Carcinogenicity	Based on the available data, the classification criteria are not met
Reproductive toxicity	Based on the available data, the classification criteria are not met
Specific target organ toxicity (STOT) - single exposure	Based on the available data, the classification criteria are not met
Specific target organ toxicity (STOT) - repeated exposure	Based on the available data, the classification criteria are not met
Aspiration hazard	Based on the available data, the classification criteria are not met

#### 11.2 Information on other hazards

##### 11.2.1. Properties of endocrine disruptors

FeSiMn does not contain any substances to the obligation to declare a content of > 0.1% that would fall within the definition of confirmed endocrine disruptors under any EU Regulation.

##### 11.2.2. Other information

Human health hazards may arise from exceeding the occupational exposure limit (OEL) for manganese. Long-term exposure to excessive levels of manganese may lead to manganese poisoning. May cause damage to the following organs: blood, lungs, brain, central nervous system (CNS).

Exposure to manganese (Mn) causes clinical signs and symptoms resembling, but not identical to, Parkinson's disease.

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## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

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

Ingredient	Test	Period	Result	Species
Manganese (Mn)	EC <sub>50</sub>	48 h.	1.6 mg/l	Daphnia magna
Manganese (Mn)	LC <sub>50</sub>	96 h.	>3.6 mg/l	fish
Manganese (Mn)	NOEC	8 days	1.7 mg/l	Daphnia magna
Iron (Fe)	LC <sub>50</sub>	48 h.	56 mg/l	rat
Silicon (Si)	LC <sub>50</sub>	48 h.	190 mg/l	rat

Algae and aquatic plants: tested material: manganese (Mn)

Based on: growth rate	Based on: yield
EC <sub>50</sub> (72 h): 4.5 mg/l test. mat.	EC <sub>50</sub> (72 h): 2.8 mg/l test. mat.
NOEC (72 h): 2.5 mg/l test. mat.	NOEC (72 h): 2.5 mg/l test. mat.
LOEC (72 h): 5.3 mg/l test. mat.	LOEC (72 h): 5.3 mg/l test. mat.
EC <sub>10</sub> (72 h): 3.4 mg/l test. mat.	EC <sub>10</sub> (72 h): 2.6 mg/l test. mat.
EC <sub>20</sub> (72 h): 3.7 mg/l test. mat.	EC <sub>20</sub> (72 h): 2.6 mg/l test. mat.

### 12.2 Persistence and degradability

**Abiotic degradation:** No relevant information available

**Physical and photochemical elimination:** No relevant information available

**Biodegradation:** Not determined for inorganic substances.

### 12.3 Bioaccumulative potential

No or very low potential for bioconcentration and bioaccumulation.

### 12.4 Mobility in soil

No potential for passage to groundwater - no data available.

A 72-hour adsorption/desorption study (OECD 106) on MnCl<sub>2</sub> (the more soluble/readily available form of manganese (Mn<sup>2+</sup>)) in 35 different soil types shows that adsorption is pH sensitive. A median K<sub>d</sub> of 994 ml/g was determined for all soil types.

### 12.5 Results of PBT and vPvB assessment

FeSiMn is an inorganic material and cannot be classified as a PBT/vPvB substance.

FeSiMn is not known to contain >0.1% or <0.1% PBT/vPvB impurities.

### 12.6 Properties of endocrine disruptors

FeSiMn does not contain any substances subject to the obligation to declare >0,1 % that would fall within the definition of confirmed endocrine disruptors under any EU Regulation.

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#### 12.7 Other adverse effects

Information is not available.

### 13. DISPOSAL CONSIDERATIONS

#### 13.1 Waste treatment methods

FeSiMn is not listed as hazardous waste in the European Waste List (Decision 2000/532/EC), nor according to the Waste Directive 2008/98/EC. Recycle unused products in accordance with national legislation.

Disposal must comply with environmental protection and waste disposal legislation.

##### 13.1.1 Disposal of the product/packaging

Information is not available.

##### 13.1.2 Information on waste treatment

For disposal within the EC, the appropriate European Waste List (EWL) code should be used. The tasks of the polluter include assigning waste to waste codes specific to industries and processes according to the European Waste List (EWL).

##### 13.1.3 Information on waste water disposal

Do not flush into the drains.

##### 13.1.4 Other disposal recommendations

Information is not available.

### 14. TRANSPORT INFORMATION

Not hazardous for transport. Transport according to ADR / TPC standards for road transport, RID by rail, IMDG by sea, ICAO / IATA for air transport and DNA for inland navigation.

Transported in bulk or in big bags in tipper/canvas trucks, open/closed wagons, containers. For sea transport it is transported in bulk or in containers.

#### 14.1. UN number

Not applicable.

#### 14.2. UN proper shipping name

Not applicable.

#### 14.3. Transport hazard class(es)

Not applicable.

#### 14.4. Packing group

Not applicable.

OFZ, a. s., Široká 381, 027 41 Oravský Podzámok, Slovakia

Telephone

+421 43 5804 111

Fax

+421 43 5804 320

Bank Account

SK431100000002621706224

Reg. No.

36 389 030

VAT No.

SK 2020131476

e-mail

ofz@ofz.sk

Registration: Business Register, District Court of Žilina, Section: Sa, Insert No.: 10228/L



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for

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#### 14.5. Environment hazards

Not applicable.

#### 14.6. Special precautions for user

Not applicable.

#### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

### 15. REGULATORY INFORMATION

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

##### EU regulations:

Regulation (EC) No. 1907/2006 REACH

Regulation (EC) No. 1272/2008 CLP

Commission Regulation (EU) 2020/878 amending Annex II of No 1907/2006 – REACH

Dangerous Substances Directive 67/548/EEC

Dangerous Preparations Directive 1999/45/EC

Decision No. 2000/532/EC – European Union list of hazardous waste

Directive on limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air No 1999/30/EC

#### 15.2 Chemical safety assessment

Chemical Safety Report - November 2024 (MARA).

### 16. OTHER INFORMATION

#### 16.1 List of abbreviations used

Abbreviation	Meaning
ADR/RID	European Agreement on the International Carriage of Dangerous Goods by Road/Rail
BC code	International Code on the Carriage of Bulk Cargo and Concentrates by Sea
CAS number	A unique accession number assigned by the Chemical Abstracts Service (CAS)
CLP	Regulation on classification, labeling and packaging of chemical substances and mixtures
DNEL	derived no-effect level
EC number	The European Community number
EC <sub>50</sub>	Median effective concentration
EU	European union
IATA	International Air Transport Association
IC <sub>50</sub>	Median inhibitory concentration
IMDG	International Maritime Dangerous Goods Law
IMO	International Maritime Organization
IBC code	International Code for the Construction and Equipment of Ships Carrying Hazardous Chemicals as Bulk Cargo, as amended.
IMSBC code	International Code for the Maritime Carriage of Solid Bulk Cargoes, as amended
LC <sub>50</sub>	Median lethal concentration

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LD <sub>50</sub>	Median lethal dose
MARPOL	International Convention for the Prevention of Pollution from Ships
NOAEC	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NPEL	The highest permissible exposure limits of gases, vapors and aerosols with mostly toxic effect in the working atmosphere
OEL	workplace exposure limit value
PBT	persistent, bioaccumulative and toxic substances
PNEC	predicted no-effect concentration
REACH	Registration, evaluation and authorization of chemical substances
SOLAS	International Convention on the Safety of Life at Sea from 1974, as amended.
SK	Slovak Republic
STOT	Specific Target Organ Toxicity
T/D test	substance solubility test
UN number	four-digit number that identifies dangerous goods, hazardous substances and articles (OSN)
vPvB	very persistent, very bioaccumulative substances

### 16.2 List of changes compared to the previous revision

Replaces KBU-OFZ-10-EN, rev. No. 8, July 27, 2023 (translation by KBU-OFZ-10-SK, rev. No. 8 of July 27, 2023).  
This document is a translation of KBU-002-SK, rev. No.0 of December 1, 2024.

### 16.3 Key Resources

1. Assem, F. L., et al, (2011); The Mutagenicity and carcinogenicity of inorganic manganese compounds: A synthesis of the evidence, Journal of toxicology and environment, part B
2. Bounds, S. V. J., (2009); TOXICOKINETIC ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorisation of Chemicals*, Regulation (EC) No. 1907/2006 (REACH)-MANGANESE AND ITS INORGANIC COMPOUNDS
3. Butler, R E. and O'Connor, B. J., (2009); HCFeMn (Assmang manganese): Determination of Relative density
4. Furnes, B. and Strupp, C., (2009); REPROTOXICITY ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorisation of Chemicals*, Regulation (EC) No. 1907/2006 (REACH)- MANGANESE AND ITS INORGANIC COMPOUNDS
5. Goodband, T. J. and Mullee, D. M., (2010); HCFeMn Acute toxicity to daphnia magna
6. Gut, J. (2009); NEUROTOXICITY ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorisation of Chemicals*, Regulation (EC) No. 1907/2006 (REACH)-MANGANESE AND ITS INORGANIC COMPOUNDS
7. Jenkinson, J., (2009); GENOTOXICITY ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorisation of Chemicals*, Regulation (EC) No. 1907/2006 (REACH)-MANGANESE AND ITS INORGANIC COMPOUNDS
8. McGough, D and Jardine, L (2016) A two-generation inhalation reproductive toxicity study upon the exposure to manganese chloride; Journal of Neurotoxicology
9. SCOEL/SUM/127., (2011); EC recommendation from the scientific committee on occupational exposure limits for manganese and inorganic manganese compounds
10. Tremain, S.P and Atwal, S.S., (2009); HCFeMn: Determination of Melting/Freezing Temperature
11. Lillicrap A. Assessment of the Transformation/Dissolution (T/D) Data Generated for FeSi (high Ba). Norwegian Institute for Water Research. Lab. Testing Report n° 025-2010, Serial No. O-10158 of March 2011.
12. Merck Index. - 10th edition – Chemical safety management

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Fax

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13. INRS – Fiche Toxicologique (toxicology sheet)
14. Regulation (EC) 1907/2006 of the European Parliament and of the Council (REACH)
15. Regulation (EC) 1272/2008 of the European Parliament and of the Council (CLP)  
Regulation 2020/878 (EU) (Annex II of REACH)

#### 16.4 Other information

The information contained in this document corresponds to the current state of our knowledge in accordance with current legal requirements for information, packaging and labeling of hazardous chemical substances. The criteria for compliance with the data contained in this Safety Data Sheet are the responsibility of the user of the product, and their compliance does not exempt him from the obligation to respect a set of legislative, regulatory and administrative texts relating to the product, safety and hygiene and the environment.

**Approved by:**

m.p.

**Ing. Milan Harcek**  
technical director

**Edited by:**

m.p.

**Ing. Zuzana Bohúňová**  
QHSE manager

OFZ, a. s., Široká 381, 027 41 Oravský Podzámok, Slovakia

Telephone

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