

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 1/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

PRODUCT SAFETY DATA SHEET

for

Ferrosilicomanganese

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

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

1.1 Product identifier

Name of the preparation: Ferrosilicomanganese
Synonyms: SiMn / silicomanganese
Trade name: FeSiMn

1.2 Relevant identified uses of the substance/mixture and uses advised against

Manufacturing of metals, including alloys

Used for steel production

Additive

Used in the production of metal castings

Uses not recommended: None

1.3 Details of the supplier of the safety data sheet

Name: OFZ, a.s.
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

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 2/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

1.4 Emergency telephone number

European emergency tel. number: 112

Emergency phone number
company: +421/43/5804 111

National toxicological
information center: +421 2 5477 4166

2. HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

2.1.1 Classification of the substance according to the CLP / GHS regulation

The substance does not meet the criteria for inclusion in accordance with Regulation EC 1272/2008.

2.2 Label elements

2.2.1 Labeling according to the CLP / GHS regulation

The substance does not meet the criteria for inclusion in accordance with Regulation EC 1272/2008.

Signal word: none.

2.3 Other hazards

If the substance is dispersed, it can form explosive mixtures of dust in the air.

Although the substance does not meet the classification criteria based on the available literature according to the EU CLP regulation on long-term exposure at high concentrations, the neurotoxic effects have been reported. The substance is not considered an endocrine disruptor.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Description: SiMn is an alloy of manganese, silicon and iron.

3.1 Constituents

Silicomanganese is not considered a substance.

3.2 Admixtures

Ferromanganese alloy is considered a special preparation according to the EU REACH regulation and a mixture according to the EU CLP regulation. Its impurities are negligible and will not affect the classification

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 3/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

Constituents	Concentration span	REACH registration number
Component 1: Mn (manganese) CAS: 7439-96-5 EINECS: 231-105-1	min. 65% (w/w)	01-2119449803-34-0033
Component 2: Fe (iron) CAS: 7439-89-6 EINECS: 231-096-4	12 - 17% (w/w)	01-2119462838-24-0093
Component 3: Si (Silicon) CAS: 7440-21-3 EINECS: 231-130-8	min. 14% (w/w)	01-2119480401-47-0050

4. FIRST AID MEASURES

4.1 Description of first aid measures

<u>General information:</u>	In case of accidental exposure leading to nausea, seek immediate medical attention.
<u>Inhalation:</u>	Mechanical irritation caused by dust in the respiratory tract: Move the person out of the dusty area.
<u>Skin contact:</u>	Wash the skin with water or mild soap.
<u>Eye contact:</u>	Flush the eyes with water or saline solution. In case of persistent discomfort, consult a doctor.
<u>Ingestion:</u>	Not likely. However, if swallowed, do not induce vomiting and seek medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

Dust particles can cause physical effects on the eyes and lungs leading to itching and coughing.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable:

Silicomanganese is not flammable and its dust does not pose an explosion threat.

It is not established

Unsuitable:

Do not extinguish molten SiMn with water. Wet material added to molten SiMn can cause an explosion hazard.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 4/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

5.2 Special hazards arising from the substance or mixture

The substance can form various products when used, especially oxides of elements.

5.3 Advice for firefighters

Let the fire burn itself out. Do not touch hot metal when extinguishing.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

- a) Use personal protective equipment such as dust masks, goggles and coveralls to minimize inhalation, eye and skin contact for good industrial hygiene. See Section 8 for more details.
- b) There must be dust control and sufficient ventilation. Avoid all sources of ignition.
- c) In case of accidental release, evacuate and consult with trained personnel

6.1.2 For emergency personnel

Remove persons to safety. Isolate the hazardous area and prevent unauthorized persons from entering. Adequately ventilate closed spaces. Use personal protective equipment. See sections 8 and 13.

6.2 Environmental precautions

Based on the available studies, the given substance does not endanger the environment. However, large amounts of material can clog drains, so disposing of it in this way is not recommended.

6.3 Methods and material for containment and cleaning up

In case of spillage, collect contaminated material and place in appropriate containers for disposal. Dispose of as special waste in accordance with local and national regulations.

6.3.1 Prevention of proliferation

Collect in closed and suitable containers for disposal.

6.3.2 Cleaning

Clean contaminated objects and areas by strictly following environmental regulations.

6.4 Reference to other sections

For more detailed information regarding exposure controls and personal protective equipment, see section 8.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 5/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

- a) Use only in well-ventilated areas. Avoid dust generation. Wear personal protective clothing (See section 8)
- b) Avoid handling incompatible substances / mixtures
- c) Avoid dust-generating activities or perform them in a well-ventilated area.
- d) Capture dust if possible and press it into pellets to mitigate the impact on the environment.

7.1.2 Advice on general hygiene at work

Do not eat, drink or smoke in the work area Wash hands before and after use and keep them dry Remove contaminated clothing and PPE before entering food areas

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 environment: The substance is not explosive, but must be stored away from potentially explosive materials
- ii) Corrosive conditions: Therefore, the substance have no corrosive properties on the metals, no adverse corrosive effects are expected.
- iii) Flammability hazard: The substance is not flammable, but keep away from flammable materials
- iv) Incompatible materials or mixtures: the information on the company`s procedure will be provided.
- v) Evaporation conditions: Avoid storage in the vicinity of organic evaporating materials/substances.
- vi) Potential sources of ignition: Keep away from sources of ignition.

b) How to control effects from environmental conditions

Weather conditions, ambient pressure, different temperatures, sunlight and vibration do not affect the integrity of the product. Do not store in the humid environment.

c) How to preserve the integrity of the substance

The substance is very stable under normal conditions of use. They do not decompose or fall apart. Stabilizers and antioxidants are not required.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 6/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

d) Further advice

- i) Ventilation requirements: Provide adequate ventilation and store at room temperature.
- ii) Specific storage instructions: Keep/store only in original containers/packaging.
- iii) Quantitative limits in storage conditions: There is no limitation because the substance does not pose any physical and chemical hazards.
- iv) Packaging compatibility: Store in original/similar packaging. Protect the container/packaging from damage.

7.3 Specific end use(s)

Recommendations: Follow the instructions for use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limit values

8.1.1 Workplace exposure limits

EU SCOEL OEL values for manganese and its inorganic compounds 0.2 mg/m³ - inhalable and 0.05 mg/m³ respirable.

8.1.1.1 National limits Highest permissible exposure limits (NPEL)

For manganese and its inorganic compounds (such as manganese - CAS 7439-96-5), the highest value is set at 0.2 mg/m³ as the inhalable fraction and 0.05 mg/m³ as the respirable fraction.

8.1.1.2 EU limits

0.2 mg/m³ inhalable fraction and 0.05 mg/m³ respirable fraction.

8.1.1.3 EU biological limit values

There are no biological limit values for inorganic manganese.

8.1.2 Monitoring Procedures

To control possible exposure, it is necessary to prevent the formation and stirring of dust. The use of suitable protective equipment is recommended. If FeMnC dust is visible, take occupational safety measures preventing fine dust above 0.2 mg/m³ in the workplace.

8.1.3 Creation of air contaminants

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

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 7/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

8.1.4 Derived No Effect Limits (DNELs)

Predicted No-Effect Concentrations (PNEC):

8.1.5 Control zone

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

8.2 Exposure controls

To control possible exposure, it is necessary to prevent the formation and stirring of dust. The use of suitable protective equipment is recommended. If SiMn dust is visibly swirled, take occupational safety measures preventing the swirling of fine dust above 0.2 mg/m³ at the workplace.

8.2.1 Workplace exposure control

Measure the workplace exposure limit regularly. If dust is generated during the handling of the material, use an extraction or ventilation system or other means to maintain dust limit values in the air.

8.2.2 Personal protective equipment

Protective clothing, safety glasses and masks are mandatory during use.

8.2.2.1 Other protective work equipment

Good industrial hygiene is essential. Store and use in well-ventilated areas. See section 5 for more information.

8.2.2.2 CEN requirements for protective equipment

- a) Eye / face protection: safety glasses
- b) Skin protection: Protective clothing, gloves and boots are mandatory, as the substance irritates the skin (indicate the type of overalls, gloves and boots, including the thickness of the material.)
- c) Respiratory protection: Respirator FFP 2 / N95
- d) Thermal hazard: Not specified

8.2.3 Environmental exposure controls

The substance is not harmful to the environment.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 8/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	silvery-green substance in a solid state in lump form
Odor:	none
Odor threshold:	none, the substance is odorless
pH:	not determined
Boiling point:	not determined (substance in solid state with melting point > 300°C)
Melting/solidification temperature:	not determined (>723 °K/>450 °C) - regulation (EC) no. 440/2008, Annex, A1
Flash point:	not determined (substance is inorganic)
Flammability:	not very flammable, Regulation (EC) no. 440/2008, Method A1 0
Explosive properties:	not explosive
Oxidizing properties:	does not oxidize
Vapor pressure:	not determined (melting temperature > 300°C)
Relative density	6.33 at 21 °C, regulation (EC) no. 440/2008, annex, A3
Bulk weight:	approx. 3,500 kg/m ³
Solubility in water:	insoluble
Distribution coefficient n-octanol/water (log. value):	not determined (substance is inorganic)
Viscosity:	not determined (at normal ambient temperature, the substance is solid and not liquid)
Auto-ignition temperature:	none
Dissociation constant:	the substance does not decompose due to the lack of appropriate functional groups
Surface tension:	the substance is not active on the surface
Stability in organic solvents:	not determined (substance is inorganic)

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 9/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

9.2 Other information

9.2.1 Physical hazard classes

Explosive properties	Not expected to be explosive
Flammable gases	Not applicable because the substance is a solid
Aerosols	Not applicable under normal conditions of use
Oxidizing gases	Not applicable because the substance is solid
Gases under pressure	Not applicable because the substance is solid
Flammability of liquids/solids	Non-flammable
Self-reactive substances and mixtures	Not self-reactive
Self-igniting liquids	Not applicable because the substance is a solid
Self-igniting solids	Does not have self-igniting properties
Self-heating substances and mixtures	Self-ignition does not occur
Substances and mixtures which release flammable gases in contact with water	Not expected to release flammable gases in contact with water
Oxidizing liquids/solids	Non-oxidizing substance (method A17)
Organic peroxides	Does not apply to inorganic substances
Corrosive to metals	The substance is not corrosive to metals
Desensitized explosives	Not applicable

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data are available for this substance.

10.2 Chemical stability

Under normal temperature conditions, conditions of storage and use, the given substance is stable.

10.3 Possibility of hazardous reactions

If the material is handled and stored according to the instructions, there is no risk of dangerous reactions.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 10/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

10.4 Conditions to avoid

Avoid contact of melt with water. A violent explosion may occur when molten material comes into contact with water.

10.5 Incompatible Materials

Water.

10.6 Hazardous decomposition products

They are not, if the preparation is used in accordance with the intended use.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

End points	The result of the impact assessment
Acute toxicity	It does not pose any risk: All studies carried out on the individual components of the preparation did not show any negative results. Therefore, no acute toxicity is expected for this preparation.
Skin corrosion/Skin irritation	According to the available studies, no irritation is expected in rabbits (according to OECD test guidelines No. 404 and EU method B.4, GLP) with the use of individual ingredients/substances.
Serious eye damage/Eye irritation	Based on the available studies, no eye irritation is expected in the rabbit (according to OECD test guidelines No. 405 and EU method B. 5, GLP) with the use of individual ingredients/substances.
Respiratory or skin sensitization	Based on the available studies, skin sensitization in mice is not expected (according to OECD test guidelines No. 429 and EU method B.42, local lymph node analysis, GLP) with the use of individual ingredients/substances. There are no data on respiratory tract sensitization. However, the substance is not expected to act as a respiratory sensitizing agent.
Germ cell mutagenicity	Negative in all tests using MnCl ₂ - a highly soluble salt, which is considered a worse option for impact assessment: <ul style="list-style-type: none">• Ames test, <i>S. typhimurium</i>, TA 98, TA 100, TA 1535, TA 1537, <i>E. coli</i> WP2 uvrA (OECD test guidelines TG 471, EU method B13 and GLP); No toxicity was observed up to a concentration of 5000 µg/dish.• In vitro mammalian cell gene mutation assay with L5178Y mouse lymphoma cells (OECD Test Guideline No. 476 and GLP); Negative for murine lymphoma cells, cytotoxicity: yes, induced toxicity absent at highest dose.• In vitro mammalian chromosome aberration test with human lymphocytes (OECD Test Guideline No. 473 and GLP). Negative for lymphocytes. cytotoxicity: yes

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 11/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

Carcinogenicity	No carcinogenicity studies are available for this substance. However, since all in-vitro genotoxicity tests of the more biologically widespread manganese salt were negative and an expert report (Jenkinson, 2009) as well as a review of the professional literature on the carcinogenicity of Mn and its inorganic compounds (Assem et al. 2011) do not speak of any concerns, the carcinogenicity of the substance not expected in humans.
Reproductive toxicity	Two-generation reproductive toxicity study in rats (male and female) using MnCl ₂ by inhalation (OECD Test Guideline No. 416, GLP): The substance is not toxic
Specific target organ toxicity (STOT) - single exposure	Based on the available data, the criteria for inclusion of the substance are not met.
Specific target organ toxicity (STOT) - repeated exposure	Based on the available data, the substance does not meet the criteria for inclusion. However, epidemiological studies from some metallurgical companies with manganese smelting have demonstrated the possibility of an adverse impact on human health through repeated, long-term inhalation of dust exceeding exposure limits.
Risk of aspiration	Lack of data.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No environmental concerns.

Acute (short-term) toxicity:

Current ecotoxicity studies of individual additives/components of the given substance according to OECD and GLP guidelines showed negative results. An acute toxicity study in pearl oysters (OECD Test Guideline No. 202, EU Method C2 and GLP. EC50/LC50 (48 hours) for freshwater invertebrates) of the preparation (SiMn) resulted in EC 50 >2.5mg/L, NOEC₂, 5 mg/L.

Environmental Limits: Predicted No Effect Concentrations (PNEC) and Predicted Effects Concentrations for the environment are not derived for this special preparation/mixture as it is not mandatory

12.2 Persistence and degradation

No potential for persistence - data missing

12.3 Bioaccumulative potential

No potential for bioaccumulation - no data

12.4 Mobility in soil

There is no potential for transfer to groundwater – data are missing

12.5 Results of PBT and vPvB assessment:

It is assumed that the product will not be PBT and vPvB

12.6 Properties disrupting the endocrine system:

The mixture/special preparation is not considered to be an endocrine disruptor based on the available literature - missing data.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 12/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

12.7 Other adverse effects: None known

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Disposal of SiMn must be in accordance with local and national legislation. The unused content of HC SiMn should be consumed by the user or recycled according to national legislation in the R4 way (recovery of metals). The unused product is not a hazardous waste.

14. TRANSPORT INFORMATION

FeSiMn is transported in bulk or in big bags on tarpaulin-covered trucks, in open/closed wagons or in containers.

During a sea transport, FeSiMn 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

It is not dangerous.

14.4 Packing group

Not applicable

14.5 Danger to the environment

It is not dangerous to the environment.

14.6 Special safety measures for users

Always transport in closed packaging (big-bags, containers...). Avoid generation of dust. Avoid wetting the material during transportation.

14.7 Bulk transport according to Annex II to MARPOL73/78 and the ISBC code

Not applicable.

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 13/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legal regulations concerning the substance:

GHS - UN Globally Harmonized System of Classification and Labeling of Chemical Substances (GHS):
According to Chapter 1.5.2 of the UN Globally Harmonized System of Classification and Labeling of Chemical Substances (GHS), safety data sheets (SDS) are required only for substances and mixtures that meet the harmonized criteria for endangering safety, health and the environment. This product does not meet these criteria.

EU CLP - CLP Regulation on classification, labeling and packaging of chemical substances and mixtures:

According to Article 59(2)(b) EC no. 1272/2008 (CLP), regulating Article 31(1) of the REACH regulation, safety data sheets (SDS) are required only for substances and mixtures/special preparations that meet the criteria for endangering safety, health and the environment. Since this product does not meet the given criteria, a safety data sheet according to EC 453/2010 will not be issued. To provide information related to safety and health and environmental protection, product safety information will be provided instead.

EU REACH - Registration, evaluation and authorization of chemical substances:

According to Article 31(7) of the REACH Regulation, exposure scenarios resulting from the Chemical Safety Report (CSR) are required to be documented as an annex to the Safety Data Sheet. However, according to the REACH regulation Annex I, part 0. (Introduction), subsection 0.6. no. 4 and 5 such exposure scenarios are required only for substances and mixtures that are classified as dangerous. As this product is not classified as hazardous in the sense of CLP, the provision of exposure scenarios is not required." A chemical safety assessment was carried out for the main components of this substance. According to the REACH regulation, this substance does not require authorization.

There are no special regulations, restrictions and prohibitions.

15.2 Chemical safety assessment

A chemical safety assessment has not been performed for this substance

16. FURTHER INFORMATION

These data are based on our current knowledge, but do not represent any guarantee of any particular product properties and do not establish any legally binding contractual relationships.

a) Changes in the version from December 19, 2022 compared to the version from April 20, 2021:

Implementation of the recommendations of the International Manganese Institute.

Amendment of EU Commission Regulation 2020/878

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN
Rev. No. 8
Page 14/ 15
Release date: May 2, 2010
Date of revision: July 27, 2023

16.1 List of abbreviations used

DNEL:	derived no effect limit
EC ₅₀ :	mean value of the effective concentration
LC ₅₀ :	median value of the lethal concentration
NOEC:	no observed effect concentration
OEL:	workplace exposure limit value
PBT:	persistent, bioaccumulative and toxic substances

a) References:

1. Assem, FL, 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, SVJ, (2009); TOXICOKINETIC ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorization of Chemicals*, Regulation (EC) No. 1907/2006 (REACH) - MANGANESE AND ITS INORGANIC COMPOUNDS
3. Butler, R E. and O'Connor, BJ, (2009); HCFeMn (Assamang manganese): Determination of Relative density
4. Furnes, B. and Strupp, C., (2009); REPROTOXICITY ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorization of Chemicals*, Regulation (EC) No. 1907/2006 (REACH) - MANGANESE AND ITS INORGANIC COMPOUNDS
5. Goodband, TJ and Mullee, DM, (2010); HCFeMn Acute toxicity to daphnia magna
6. Gut, J. (2009); NEUROTOXICITY ASPECTS: *Assessment of Toxicological Endpoints for the Registration, Evaluation and Authorization 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 Authorization 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 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, SP and Atwal, SS, (2009); HCFeMn: Determination of Melting/Freezing Temperature

PRODUCT SAFETY DATA SHEET

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

Number: KBU-OFZ-10-EN

Rev. No. 8

Page 15/ 15

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