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

1.1. Product identifiers

Product name: Manganese-Zinc Ferrite powder (iron manganese zinc oxide) / (Mn, Zn) Fe₂O₄

CAS-No.: 12645-49-7

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

Identified uses: Production of soft-magnetic products by preparation

1.3. Details of the supplier of the safety data sheet

Company: Ferroxcube Poland Sp. z o.o. Zwierzyniecka 2 PL-96-100 SKIERNIEWICE

Telephone: +48 46-834 00 01 / + 48 46-834 09 16
Fax: +48 46-834 00 17

1.4. Emergency telephone number

Emergency phone: fire brigade: 998

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1273/2008 [EU-GHS/CLP]
Skin sensitization (H317 - May cause an allergic skin reaction)

2.2. Label elements

Labeling according Regulation (EC) No 1272/2008 [CLP]

Pictogram:

![Pictogram]

Signal Word: Warning

H317 - May cause an allergic skin reaction

Precautionary statement(s):

- P261 – Avoid breathing dust
- P280 – Wear protective gloves
- P272 – Contaminated work clothing should not be allowed out of the workplace
- P363 – Wash contaminated clothing before reuse
- P302 + P352 – IF ON SKIN: Wash with plenty of soap and water
- P333 + P313 – If skin irritation or rash occurs: Get medical advice/attention

Supplemental hazard statement: none

2.3. Other hazards

None
3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substances
Synonyms: Manganese-Zinc Ferrite / iron manganese zinc oxide

Formula in spinel structure: \( (\text{Mn}_y \text{Zn}_z) \text{Fe}_x \text{O}_4 \)
\( x = 1.9 - 2.1 \)
\( y = 0.4 - 0.9 \)
\( z = 0.1 - 0.5 \)

Binder content (in weight %):

- Polyacrylate binder: 0.4 – 2.0 %
  (Polyvinyl alcohol, polyacrylate resin, polyethylene glycol)
- Dispersant agent: max. 0.1%
- Zinc stearate: 0.0 – 0.15 %

4. FIRST AID MEASURES

4.1. Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician

In case of skin contact
Wash off with soap and plenty of water. Consult a physician

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician

Take copy of label and MSDS to physician or health professional with victim

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

4.3. Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media
Use the fire extinguishing agent appropriate for the surrounding fire

- Water Spray: YES
- Carbon Dioxide: YES
- Foam: YES
- Dry Chemical: YES
- Halon: YES
- Other: Any "ABC" Class

5.2. Special hazards arising from the substance or mixture

Incomplete combustion may form Methylmethacrylate and Ethylacrylate. At temperatures above 1000°C ZnO fumes will be formed.

5.3. Advice for firefighters

Wear self contained breathing apparatus for fire fighting if necessary

5.4. Further information

no data available
6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2. Environmental precautions
Do not wash spills into sewers or other public water systems. Notify authorities if any exposure is likely to occur.

6.3. Methods and materials for containment and cleaning up
Do not dry sweep or use methods that increase dusting. Moisten spilled material with water before sweep or use a vacuum cleaner. Put the spill into plastic bags and depot for chemical waste.

6.4. Reference to other sections
For disposal see section 13

7. HANDLING AND STORAGE

7.1. Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

7.2. Conditions for safe storage, including any incompatibilities
Store in cool place not below 8°C. Keep container tightly closed in a dry and well-ventilated place.

7.3. Specific end uses
no data available

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters
Elements controlled in industrial dust:

<table>
<thead>
<tr>
<th>Element</th>
<th>Respirable Fraction</th>
<th>Inhalable Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron oxides based on the Fe:</td>
<td>-</td>
<td>5,00 mg/m³</td>
</tr>
<tr>
<td>Manganese and its compounds based on Mn:</td>
<td>respirable fraction</td>
<td>0,05 mg/m³</td>
</tr>
<tr>
<td>Zink oxide based on Zn:</td>
<td>inhalable fraction</td>
<td>0,20 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5,00 mg/m³</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges.
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>powder</td>
</tr>
<tr>
<td>Colour</td>
<td>dark brown, black</td>
</tr>
<tr>
<td>Odour</td>
<td>odourless</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>not applicable</td>
</tr>
<tr>
<td>Melting point</td>
<td>&gt; 1500°C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>&gt; 2000°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>not applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapour density</td>
<td>no data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1200 – 1450 kg/m³</td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water</td>
<td>not applicable</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>not applicable</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>not applicable</td>
</tr>
</tbody>
</table>

9.2. Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1. Reactivity
no data available

10.2. Chemical stability
Binder (organic substances) will be decomposed at 250 – 400°C
ZnO fume may formed at temperatures above 1000°C

10.3. Possibility of hazardous reactions
no data available

10.4. Conditions to avoid
Exposure to strong acids and extreme temperatures

10.5. Incompatible materials
Strong oxidizing agents

10.6. Hazardous decomposition products
Other decomposition products: no data available
11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

- **Acute toxicity**: no data available
- **Skin corrosion/irritation**: no data available
- **Serious eye damage/eye irritation**: no data available
- **Respiratory or skin sensitization**: may cause an allergic skin reaction.
- **Germ cell mutagenicity**: no data available
- **Carcinogenicity**: no data available
- **Reproductive toxicity**: no data available (not expected to cause adverse reproductive effects in humans)

An *mutagen* is a chemical, which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An *teratogen* is a chemical, which causes damage to a developing fetus, but the damage does not propagate across generational lines. An *reproductive toxin* is any substance, which interferes in any way with the reproductive process.

- **Specific target organ toxicity - single exposure**: no data available
- **Specific target organ toxicity - repeated exposure**: no data available
- **Aspiration hazard**: no data available
- **Potential health effects**
  - **Inhalation**: may be harmful if inhaled. Causes respiratory tract irritation.
  - **Ingestion**: may be harmful if swallowed.
  - **Skin**: may be harmful if absorbed through skin. Causes skin irritation.
  - **Eyes**: causes serious eye irritation.

Additional Information: no data available

12. ECOLOGICAL INFORMATION

12.1. Toxicity: no data available
12.2. Persistence and degradability: no data available
12.3. Bioaccumulative potential: no data available
12.4. Mobility in soil: no data available
12.5. Results of PBT and vPvB assessment: no data available
12.6. Other adverse effects
    - No environmental problems expected, if handled with care.
    - There is currently no information on this product's impact on plants and animals (also on aquatic life) if this material is released into the environment. However, as with all chemical products, all work practices should be aimed at minimizing environmental contamination.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

- **Product**
  - Offer surplus and non-recyclable solutions to a licensed disposal company.
  - Contact a licensed professional waste disposal service to dispose of this material.
  - Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

- **Contaminated packaging**
  - Dispose of as unused product.
14. TRANSPORT INFORMATION

14.1. UN number
ADR/RID: - not applicable  IMDG: - not applicable  IATA: - not applicable

14.2. UN proper shipping name
ADR/RID: not dangerous goods  IMDG: not dangerous goods  IATA: not dangerous goods

14.3. Transport hazard class(es)
ADR/RID: - not applicable  IMDG: - not applicable  IATA: - not applicable

14.4. Packaging group
ADR/RID: - not applicable  IMDG: - not applicable  IATA: - not applicable

14.5. Environmental hazards
ADR/RID: no  IMDGmaribe pollutant: no  IATA: no

14.6. Special precautions for user
no data available

15. REGULATORY INFORMATION


15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
no data available

15.2. Labelling according to Regulation (EC) No 1272/2008

15.2. Chemical Safety Assessment
Not applicable

16. OTHER INFORMATION

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

Abbreviations and acronyms:
RID: Règlement concernant le transport international ferroviaire des marchandises dangereuses - Regulations Concerning the International Transport of Dangerous Goods by Rail (Annex 2 Regulations on dangerous goods to the Agreement on International Railway Freight Communications (SMGS) valid from 1 July 2006)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association"
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS/CLP: Globally Harmonized System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service (division of the American Chemical Society)