

Product: FERROSILICON (FeSi)

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1. Identification

Product identifier: FERROSILICON (FeSi)

Recommended use of the chemical: Used in steel applications

Identification Code: FS-4120-027

Supplier's name: ELFUSA Geral de Eletrofusão Ltda

Address: Rua Júlio Michelazzo, 501 - Vila Nossa Senhora de Fátima

Complement: São João da Boa Vista/SP - Brasil CEP: 13872-900

Supplier's phone number: (19) 3634-2300

Emergency phone number: (19) 3634-2300

2. Hazard identification

Classification of the substance or mixture: Chemical not classified as hazardous according to GHS.

Precautionary recommendations: Dust can form explosive mixtures in contact with air. May cause mild irritation to mucous membranes, nose and throat. Wash your hands after handling the product. It is recommended to use appropriate PPE when handling the product. Get product information before handling. In case of emergency, proceed as indicated by SDS

Other information: Not available

3. Composition/Information on ingredients

Product Type: Mixture

Hazardous ingredients or impurities and/or stabilizing additives which contribute to hazard classification:

Chemical identity	CAS Nº	Percentages or ranges of percentages
Iron	7439-89-6	>= 70.0
Silicon	7440-21-3	10 - 20
Titanium	7440-32-6	<= 5.0
Aluminium	7429-90-5	<= 5.0

Other information: *Ingredients not classified as dangerous for the classification system used, but, have occupational exposure limits established, according to section 8

4. First-aid measures

First-aid measures

- Inhalation:** Remove the victim to fresh air and keep at rest in a comfortable position for breathing. Get medical attention, if symptoms appear. Take this MSDS

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- **Skin contact:** Gently wash the contaminated skin with plenty of water. Wash contaminated clothing thoroughly with water before removing it or wear gloves. Wash clothing and shoes before re-use. Get medical attention, if symptoms appear. Take this MSDS
- **Eye contact:** Rinse carefully with water for various minutes. Remove contact lenses, if present and easy to do. In case of eye irritation, get medical attention. Take this MSDS
- **Ingestion:** Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. If swallowed, consult a doctor. Contact a POISON CENTER or a doctor, if you feel unwell. Take this MSDS

Most important symptoms/effects, acute and delayed: Chemical not classified as hazardous according to GHS. May cause mild irritation to mucous membranes, nose and throat

Indication of immediate medical attention and special treatment: Symptomatic treatment

5. Fire-fighting measures

Suitable extinguishing media: Use water spray, dry chemical, or carbon dioxide

Unsuitable extinguishing media: Do not use direct water jet

Specific hazards arising from the chemical: Dust can form explosive mixtures in contact with air. The combustion of the chemical or its containers may form toxic and irritating gases such as carbon monoxide and dioxide

Special protective actions for fire-fighters: Self-contained breathing apparatus (SCBA) and protective equipment is recommended. Containers and tanks involved in the fire should be cooled with water mist

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- **For non-emergency personnel:** Preemptively isolate from ignition sources. Do not smoke. Avoid contact with the product. If necessary, use personal protective equipment as described in section 8
- **For emergency responders:** Evacuate the area. Wear full protective equipment (safety glasses and gloves, uniform or apron, closed-shoes, and respiratory mask with filters against particulate material). Isolate the leakage preventively from ignition sources

Environmental precautions: Prevent entry into waterways, sewers, basements, or confined areas

Methods and materials for containment: Evacuate the area of unavailable personnel. Stop the spill, if it is safe

Area isolation: As an immediate precautionary measure, isolate spill or leak area in all directions, at least, 50 meters (164,02 feet)

Methods and materials for cleaning up: Collect the product with a clean shovel or another instrument that does not disperse the product. Put the material in suitable and previously identified containers, and remove them to a safe place. For disposal, proceed according to the local legislation as described in section 13

7. Handling and storage

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Precautions for safe handling

- **Prevention of workers exposure:** Handle the product following established safety standards and use the PPE indicated in section 8. Handle in a ventilated area or with a general ventilation/local exhaust system. Avoid formation of particles and mists. Avoid exposure to the product
- **Fire and explosion:** Avoid excessive dust, sparks, open flames, welding operations and the accumulation of electrostatic charges in dry product area. Danger of explosion in case of high concentration of dust from the product
- **Precautions for safe handling:** Handle the product according to the established safety rules and use the PPE indicated in section 8. Avoid contact with skin and eyes
- **Hygiene measures**
 - **Suitable:** Wash hands et al thoroughly after handling and before eating, drinking, or going to the bathroom. Contaminated clothing must be changed and washed before re-use
 - **Unsuitable:** Eating, drinking or smoking in the workplace

Conditions for safe storage

- **Conditions for safe storage:** Store in a well-ventilated, dry place away from sunlight. Keep container closed. Keep stored at room temperature. It is not necessary to add stabilizers and antioxidants to ensure the durability of the product
- **Conditions to avoid including incompatibilities:** Not available
- **Packaging materials**
 - **Suitable:** Similar to the original packaging
 - **Unsuitable:** Not available

Other information: Not available

8. Exposure controls/personal protection

Control parameters

- **Occupational exposure limits:** ACGIH -Threshold Limit Value - Aluminum metal (Aluminum metal and insoluble compounds) - TWA: 1 mg/m³ (respirable particulate matter). Canada provinces: Alberta - Aluminium métal et composants insolubles (8 hours) – TWA: 10 mg/m³. Nunavut - Aluminium métal et composants insolubles (8 hours) - TWA: 10 mg/m³. Aluminium métal et composants insolubles (15 minutes) - TWA: 20 mg/m³. Ontario - Aluminium métal et composants insolubles – TWA: 1 mg/m³ (R). Québec - Aluminium métal et composants insolubles – TWA: 10 mg/m³. Saskatchewan - Aluminium métal et composants insolubles (8 hours) – TWA: 10 mg/m³. Aluminium métal et composants insolubles (15 minutes) TWA: 20 mg/m³
- **Biological indicators values:** Not available
- **Other limits and values:** Not available

Appropriate engineering controls: Ensure direct mechanical ventilation and exhaust system to the outside

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environment. These measures help reducing exposure to the product and maintaining atmospheric concentrations, of the constituents of the product, below indicated occupational exposure limits. Keep an emergency shower and eyewash station near the workplace

Individual protection measures, such as personal protective equipment

- **Eye/face protection:** Safety glasses with side protection
- **Skin protection:** Wear protective clothing (uniform or apron) and closed shoes
- **Respiratory protection:** The use respiratory protective mask with a filter against particulate material (e.g. P2 or P3) is recommended
- **Hands protection:** Wear protective gloves - e.g. nitrile rubber, PVC, rubber, or neoprene
- **Thermal hazards:** It does not present thermal hazards

Other information: Not available

9. Physical and chemical properties

- **Appearance**
Physical state: Solid; **Form:** Powder and granules; **Color:** Silver
- **Odour:** Odorless
- **Odour threshold:** Not available
- **pH:** Not available
- **Melting point/freezing point:** ~2552°F (~1400°C)
- **Initial boiling point:** Not available
- **Boiling range:** Not available
- **Flash point:** Not available
- **Evaporation rate:** Not available
- **Flammability (solid, gas):** Not available
- **Lower flammability or explosive limits:** Not available
- **Upper flammability or explosive limits:** Not available
- **Vapour pressure:** Not available
- **Vapour density:** Not available
- **Relative density:** Not available
- **Solubility(ies):** Insoluble in water
- **Partition coefficient: n-octanol/water:** Not available
- **Auto-ignition temperature:** Not available
- **Decomposition temperature:** Not available
- **Viscosity:** Not available
- **Additional information:** Density in bulk: 3.00 - 6.00 g/cm³

10. Stability and reactivity

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Chemical stability: Stable product under normal conditions of temperature and pressure

Reactivity: Under normal conditions of use, storage and transportation material should be non-reactive

Possibility of hazardous reactions: There are not known hazardous reactions with the product

Conditions to avoid: High temperatures, humidity and, sources of ignition

Incompatible materials: There are not known incompatible materials

Hazardous decomposition products: There are not known hazardous decomposition product

11. Toxicological information

Acute toxicity: The product has not been classified for this hazard under GHS criteria. Estimated Acute Toxicity of the mixture (ETAm) ETAm (oral): > 5000.0 mg/kg

Skin corrosion/irritation: The product has not been classified for this hazard under GHS criteria

Serious eye damage/irritation: The product has not been classified for this hazard under GHS criteria

Respiratory or skin sensitization: The product has not been classified for this hazard under GHS criteria

Germ cell mutagenicity: The product has not been classified for this hazard under GHS criteria

Carcinogenicity: The product has not been classified for this hazard under GHS criteria. Aluminium [7429-90-5] - not classified as carcinogenic (Group A4 - ACGIH, 2020)

Reproductive toxicity: The product has not been classified for this hazard under GHS criteria

STOT-single exposure: The product has not been classified for this hazard under GHS criteria

STOT-repeated exposure: The product has not been classified for this hazard under GHS criteria

Aspiration hazard: The product has not been classified for this hazard under GHS criteria

Additional information: May cause mild irritation to mucous membranes, nose and throat

12. Ecological information

Toxicity: The product has not been classified for this hazard under GHS criteria

Persistence and degradability: Due to the absence of data, it is expected that the product presents persistence and it is not considered rapidly degradable

Bio accumulative potential: Due to the absence of data, it is not expected that the product presents bio accumulative potential in aquatic organisms.

Mobility in soil: Solid product, low soil mobility is expected

Other adverse effects: None known

13. Disposal considerations

Disposal methods

- **Product:** Keep the product remains in its original packing and properly closed. Dispose of contents/container in accordance with local/state regulations
 - **Used package:** Do not reuse empty containers. Dispose of in accordance with local/state regulations
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14. Transport information

National and international regulations:

Land Transport:

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Additional information: The characteristics of the product does not meet the official criteria of dangerous goods for purposes of transportation.

Additional Regulation: DOT - U.S. DEPARTMENT OF TRANSPORTATION

15. Regulatory information

Safety, health and environmental regulations specific for the product:

OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Canada - Workplace Hazardous Materials Information System (WHMIS) to incorporate the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

16. Other information

Other information that does not belong in other sections:

This Safety Data Sheet (SDS) has been prepared based on current knowledge about chemicals and provides information about protection, safety, health and environment. It is warned that any chemical handling requires prior knowledge of its hazards by the user. The user company is responsible to promote the training of its employees about the potential product risks.

References: [ECHA] EUROPEAN CHEMICAL AGENCY. Available in: <http://echa.europa.eu/>

[HSNO] NEW ZEALAND HSNO Chemical Classification and Information Database (CCID)

[OSHA] OSHA'S Hazard Communication. Available in: <https://www.osha.gov/dsg/hazcom/>

[GHS] Globally Harmonized System of Classification and Labelling of Chemicals

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®)

Subtitles and abbreviations: ACGIH - American Conference of Governmental Industrial, BCF - Bioconcentration factor, CAS - Chemical Abstracts Service

DNEL: Derived No-effect Level

EC: European Commission

EC50: Effective Concentration 50%



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IARC: International Agency for Research on Cancer

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

PBT: Persistent, Bioaccumulative and Toxic

PNEC: Predicted No Effect Concentration

TWA: Time Weight Average

vPvB: very Persistent and very Bioaccumulative