

PRODUCT SAFETY DATA SHEET

for Ferrosilicon

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

1.1 Product identifier

Substance name:	Ferrosilicon
Chemical name:	912-631-7 / FeSi: Reaction mixture of iron, iron disilicide , iron silicide and silicon
Synonyms:	FeSi
Trade name:	FeSi75%, FeSi 65%, FeSi 45%, FeSi fraction 0-0.5
EINECS:	912-631-7
Molecular weight:	not determined
REACH registration number:	01-2119485286-28-0016

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

Brief description of the function of the substance: Deoxidation of iron alloys, alloying of alloys with silicon

Uses not recommended: None

See the identified ways of using the substance/preparation in Table 1 of the Annex to the Safety Data Sheet.

1.3 Details of the supplier of the safety data sheet

Name: Stanford Advanced Materials
Address: E-mail : sales@samaterials.com
Tel : (949) 407-8904
Address : 23661 Birtcher Dr., Lake Forest, CA
92630 U.S.A.

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

1.4 Emergency telephone number

European emergency tel. number: 112
Emergency phone number
company: +(949) 407-8904
National toxicological
information center: (949) 407-8904

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

The substance does not meet the criteria for classification as a PBT or vPvB substance.

Contact of ferrosilicon with water can lead to the formation of toxic gases.

Danger to human health can arise from the formation of toxic gases in a non-ventilated and humid transport or storage area, where people can be poisoned.

Danger to human health can also arise if the contact of FeSi with water is not prevented and the premises are not ventilated or if dust is inhaled and toxic gases are released in the lungs.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Description: The registered substance is present in the form of an alloy.

Degree of purity: < = 95.1% (mass concentration)

3.1 Constituents

Constituents	Typical concentration	Concentration span	Notes
Silicon CAS: 7440-21-3 EINECS: 231-130-8	FeSi 90%: 90.0% (by weight)	87.0-96.0% (weight)	Oxidation number: met
	FeSi 75%: 75.0% (by weight)	72.0-78.0% (weight)	
	FeSi 65%: 66.0% (weight)	65.0-70.0% (weight)	
	FeSi 45%: 45.0% (by weight)	42.0 – 50.0% (weight)	
Iron CAS: 7439-89-6 EINECS: 231-096-4	FeSi 90%: > = 6.0% (weight)	4.0-10.0% (weight)	
	FeSi 75%: > = 22.0% (weight)	18.0-24.0% (weight)	
	FeSi 65%: 30.0% (weight)	28.0-34.0% (weight)	
	FeSi 45%: 52.0% (weight)	45.0-55.0% (weight)	

3.2 Admixtures

The substance does not contain any additives necessary for classification and labeling.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General information: In contact with clothing, skin and eyes, no damage to health is expected. However, in the event of an accident or persistent discomfort, seek medical attention immediately.

Inhalation: Mechanical irritation caused by dust in the respiratory tract: Move the person out of the dusty area.

Skin contact: Wash the skin with water or mild soap.

Eye contact: Flush the eyes with water or saline solution. In case of persistent discomfort, consult a doctor.

Ingestion: Remove the source to prevent further ingestion. Look at that inhalation.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms of poisoning: Nausea, vomiting, diarrhea, weakness.

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5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable:

FeSi as a piece or in the form of granules is not flammable. Use dry sand, carbon dioxide or dry powder to extinguish the surrounding fire.

Use appropriate firefighting measures based on local circumstances and environment.

Unsuitable:

Do not extinguish with water.

5.2 Special hazards arising from the substance or mixture

Flammability test according to REACH (EC directive) showed that FeSi is not flammable.

Even though the substance tested negative in accordance with the United Nations guidelines for flammability in contact with water, wet material added to molten or hot ferrosilicon can cause explosions due to the formation of flammable hydrogen gas.

Particles of FeSi dispersed in the air can cause an explosion under certain circumstances.

5.3 Advice for firefighters

Use breathing apparatus in unventilated areas. Use appropriate firefighting measures based on local circumstances and environment.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear suitable protective equipment (see section 8).

6.1.2 For emergency personnel

Ensure adequate ventilation and ventilate these spaces before entering closed spaces.

Avoid stirring up dust.

Isolate the affected area and do not allow unprotected persons to approach the area.

Avoid inhalation: make sure the area is well ventilated or wear suitable respirators, wear suitable protective equipment. (see section 8).

Avoid getting the material wet.

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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

Keep the material in a dry environment.

Avoid stirring up dust.

Material in the form of dust must be collected in suitable containers. Material that is damp or wet must be separated from dry material and must not be collected and stored in closed containers.

FeSi in the form of dust is better vacuumed with a vacuum cleaner that does not create sources of ignition, rather than sweeping.

6.4 Reference to other sections

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

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid stirring up dust. Wear protective clothing, gloves and goggles. Wear suitable respirators where desirable.

Avoid sparks or other sources of ignition (for example, welding) in places with an increased concentration of dust.

Adding wet material to molten FeSi can cause an explosion due to the formation of flammable hydrogen gas.

Avoid contact of FeSi with acids such as hydrofluoric acid (HF) or nitric acid (HNO₃), which would lead to the formation of poisonous gases.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry and well-ventilated place away from acids and bases.

7.3 Specific end use(s)

Please check the identified uses of the substance included in Table 1 of the Annex to the Safety Data Sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limit values

Workplace exposure limit (OEL): 4 mg/m³ inhaled FeSi dust.

Derived No-Effect Limit (DNEL) for long-term exposure: 0.3 mg/m³ inhaled FeSi dust, which is achieved while keeping the OEL below the exposure limit.

PNEC_{water} : for FeSi , due to its low solubility, it is not determined.

PNEC_{soil} : low probability of soil exposure from FeSi production and from currently known uses of the material down the supply chain. There is no direct use of this indicator on soil. The soil PNEC is derived using a calculation method and data on the known effects of metal components, which indicates its value at the level of 680 mg/kg dry weight.

PNEC_{sediment} : low probability of sediment exposure from FeSi production and from currently known uses of the material down the supply chain.

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. In the case of visible accumulation of dust from FeSi, it is necessary to take occupational safety measures preventing the accumulation of dust above 4 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

8.2.2.1 Eye/face protection

Wear safety glasses.

8.2.2.2 Skin protection

Wear protective clothing, gloves and use protective hand cream.

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8.2.2.3 Protection of the respiratory system

Use a respirator.

8.2.3 Control of environmental exposure

Dust emissions from the ventilation system or workplace must be checked to see if they meet the requirements of environmental protection legislation. A concentration below 4 mg/m³ does not threaten the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	gray substance in solid state: pieces, ingots, granules or dust
Odor:	none, if gases are released in contact with water, they smell like garlic
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:	1220-1400 °C at 101.3 kPa
Flash point:	not determined (substance is inorganic in solid and not liquid state)
Flammability:	non-flammable (EU method A.16)
Explosive properties:	not determined (no chemical groups with explosive properties present in the molecule)
Oxidizing properties:	not determined (substance is not capable of exothermic reaction with flammable materials)
Vapor pressure:	not determined (melting temperature > 300°C)
Relative density:	2.5 - 7.5 g/cm ³
Solubility in water:	OECD T/D screening test: ≤ 0.02 mg Si/l at ≤ 0.04 mg Fe/l at pH 6 (21.5 °C), ≤ 0.09 mg Si/l at ≤ 0.02 mg Fe/l at pH 8 (21.5 °C) OECD 105: ≤ 0.01 mg Si/l at pH 5.8-5.9 (20 °C) ferrosilicon particles with a diameter < 1 mm
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:	> 400°C, without signs of burning (EU method A.16)
Dissociation constant:	the substance does not decompose due to the lack of appropriate functional groups

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Surface tension: the substance is not active on the surface

Stability in organic solvents: not determined (substance is inorganic)

9.2 Other information

Formation of gases: in contact with water

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.

10.4 Conditions to avoid

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

Avoid contact with water. The contact of the material with water can lead to the formation of poisonous gases that can harm human health.

Avoid contact of FeSi with acids such as hydrofluoric acid (HF) or nitric acid (HNO₃), which would lead to the formation of poisonous gases.

10.5 Incompatible materials

Water, hydrofluoric acid (HF), nitric acid (HNO₃), acids in general.

10.6 Hazardous decomposition products

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

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11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

End points	The result of the impact assessment
Toxicokinetics	Due to the low solubility and dissolution of FeSi metal components , the risk assessment of FeSi can be based on the toxicity of silicon and silica , while also taking into account the effects of slightly soluble substances such as strontium and barium.
Acute toxicity	<p>Ferrosilicon is not acutely toxic.</p> <p>Results of animal studies: Ingestion: LD₅₀ > 5,000 mg/kg body weight synthetic amorphous silicas (OECD 2004b, rat and mouse) LD₅₀ > 400 – 800 mg/kg body weight of barium carbonate (WHO (1999), rat)</p> <p>Inhalation: LC₅₀ (4 h) > 2.08 mg/l air, synthetic amorphous silica (OECD 2004b, rat)</p> <p>Through the skin: LD₅₀ > 2,000 mg/kg of body weight strontium component (WHO (2010), rat) LD₅₀ > 5,000 mg/kg body weight of silicon dioxide (Woltjen R, Calkins JE (1978a – d) The inclusion of FeSi in the framework of acute toxicity is not guaranteed.</p>
Skin corrosion/Skin irritation	<p>Results of animal studies: Ferrosilicon does not irritate the skin (several animals).</p> <p>Ferrosilicon is not likely to be a skin irritant. Material inclusion or further testing is not proposed. Naturally, as with dust, FeSi dust can also cause mechanical skin irritation.</p> <p>The inclusion of FeSi in the framework of irritation and corrosion is not guaranteed.</p>
Serious eye damage/eye irritation	<p>Results of animal studies: Ferrosilicon does not irritate the eyes (rabbit).</p> <p>Ferrosilicon is not likely to be an eye irritant. Material inclusion or further testing is not proposed. Naturally, as with any dust, FeSi dust can also cause mechanical eye irritation.</p>
Respiratory or skin sensitization	<p>No data available. Ferrosilicon is not considered a skin or respiratory tract sensitizer.</p> <p>The inclusion of FeSi in the framework of sensitization is not guaranteed.</p>
Germ cell mutagenicity	<p>Ferrosilicon is not genotoxic .</p> <p>Results of animal studies: Analysis of a sample of bacteria for the presence of a reverse mutation (Ames test, OECD 471): negative Mutation of cellular genes in mammals (OECD 476): negative <i>In vitro</i> test for the presence of chromosome anomalies in mammals (OECD 473): negative</p>

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	<p>Analysis of the sample for the presence of chromosome anomalies (OECD 475): negative Analysis of the sample for the presence of lethal mutations of dominant genes (OECD 478): negative</p> <p>Negative data on amorphous silica <i>in vitro</i> and <i>in vivo</i> , negative <i>in vitro</i> data on calcium silicate. Other main components whose mass concentration exceeds the limit limits for inclusion at the level of 0.1% (category 1A and B) and 1% (category 2) and which are dissolved in the appropriate amounts of artificial biological fluids during a period of one week (strontium and barium) they are not classified as mutagenic and, according to the available evidence, do not represent the potential for genotoxic effects.</p> <p>The inclusion of FeSi in the framework of genotoxicity is not guaranteed.</p>
Carcinogenicity	<p>Ferrosilicon is not carcinogenic.</p> <p>Results of epidemiological studies involving humans in the production of ferrosilicon or silicon metal do not show an increased incidence of cancer associated with exposure to these substances. Amorphous silica and calcium silicate have not shown carcinogenic reactions in animal tests. Also, other components that dissolve from FeSi in higher quantities than particles of synthetic amorphous silica in artificial biological fluids are not classified as carcinogenic.</p> <p>The inclusion of FeSi in the framework of carcinogenicity is not guaranteed.</p>
Reproductive toxicity	<p>Ferrosilicon is not toxic to reproduction.</p> <p>Results of animal studies: Chronic toxicity studies (OECD 452) mouse and rat: negative NOAEC 10 mg/m³ in air, rat: no evidence of carcinogenicity</p> <p>The results of epidemiological studies involving humans in the area of ferrosilicon or silicon metal production do not show an increased incidence of cancer associated with exposure to these substances. Amorphous silica and calcium silicate have not shown carcinogenic reactions in animal tests. Also, other components that dissolve from FeSi in higher quantities than particles of synthetic amorphous silica in artificial biological fluids are not classified as carcinogenic.</p> <p>The inclusion of FeSi in the framework of reproductive toxicity is not guaranteed.</p>
Specific target organ toxicity (STOT) - single exposure	<p>Based on the available data, the criteria for inclusion of the substance are not met.</p>
Specific target organ toxicity (STOT) - repeated exposure	<p>Ferrosilicon is not toxic through repeated doses.</p> <p>toxicity of FeSi: Studies show that amorphous silica does not cause systemic organ damage after ingestion, so silicon released from FeSi is unlikely to cause any adverse effects. The release of FeSi components according to solubility studies is very limited compared to synthetic amorphous silica and is unlikely to have an effect on repeated dose toxicity of FeSi.</p>

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	<p>Dermal toxicity of FeSi : insufficient number of studies.</p> <p>toxicity of FeSi : The increased incidence of COPD among workers producing and handling FeSi or silicon metal cannot be attributed to FeSi indentation , but rather to general dust exposure. The effects of amorphous silica on the lungs are likely to depend on the properties of the particles, such as their surface area. Lung effects were noted at 5-9 mg/m³ , but were mostly reversible. According to the German MAK commission, the limit value of exposure to amorphous carbon dioxide is derived at the level of 4 mg/m³ (DFG 1991). However, it is very likely that the results of experimental studies of the toxicity of amorphous silica overestimate the hazards from inhalation of FeSi due to the different properties of the particles used in these studies compared to this material.</p> <p>The classification of FeSi under repeated dose toxicity is not guaranteed.</p>
Risk of aspiration:	Lack of data.

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

12.1.1 Acute and chronic toxicity to fish

Short-term toxicity: This information is not available. To fulfill the information requirements, the results of short-term tests on fish (OECD 203/C.1) were necessary. It is not likely that there would be any effects on fish during short-term exposure due to the low solubility of individual FeSi qualities .

Long-term toxicity: The study is not scientifically justified due to the low solubility of individual qualities of FeSi .

12.1.2 Acute and chronic toxicity for aquatic invertebrates

Short-term toxicity: With a high load and a short duration of the test, problems often arise with physical effects that cause changes in behavior and immobility of the test species. A short-term high -load test for FeSi alloys is not important and necessary.

Long-term toxicity: EC₅₀ unknown, daphnia reproduction test magna (OECD 211) is ongoing.

12.1.3 Acute and chronic toxicity to aquatic plants

A study on slowing down the growth of algae and cyanobacteria is technically unfeasible due to the low solubility of individual FeSi qualities.

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12.1.4 Acute and chronic toxicity for sedimentary organisms

This information is not available. For classification and labeling purposes, tests for sedimentary organisms are not required. Only FeSi in the form of dust or fine grains can prompt further testing .

2.1.5 Acute and chronic toxicity for soil macro-organisms

This information is not available. Based on the information on the existing exposure and effects of FeSi , there is currently no need to carry out its targeted ecotoxicological testing.

12.1.6 Acute and chronic toxicity for terrestrial plants

This information is not available. Based on the information on the existing exposure and effects of FeSi , there is currently no need to carry out its targeted ecotoxicological testing.

12.1.7 Acute and chronic toxicity for soil microorganisms

The justification for abandoning the test is based on current information regarding the use of FeSi alloys . Direct exposure of individual soil components to alloys is believed to be unlikely. In the event that we cannot exclude the possibility of direct or indirect exposure of the substance to the soil, further test results may be required.

12.1.8 Acute and chronic toxicity for aquatic microorganisms

The study is not scientifically justified due to the low solubility of individual qualities of FeSi .

12.1.9 Acute and chronic toxicity to birds

This information is not available. The solubility and bioavailability of FeSi is low and, based on information on existing exposure and effects of FeSi , there is currently no need to conduct its targeted ecotoxicological testing.

12.1.10 General conclusion

The preliminary PNEC value _{for water} (drinking water) was derived on the basis of cross-information from the FeSi metal components , which are also subject to precautionary measures. The determination of the PNEC value will be completed after the results of standard long-term tests are available. The solubility of FeSi in a 7-day solubility test was a maximum of 0.3% (at pH 7.2 and 1.5) (KTH 2010). The highest solubility rate was measured for Si, Fe, Sr and Ba and small amounts of Cu, Zn, Pb.

12.2 Mobility

FeSi in lump form is immobile in soil and sedimentary rocks. Adsorption and desorption of dissolved FeSi components is mainly determined by inorganic soil and sediments. Each component behaves in a characteristic manner largely dependent on local environmental conditions. In general, it can be said that the adsorption of these components in organic materials is weak and therefore less significant.

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Silicon:

In the environment, silicon usually binds mainly with oxygen, forming silica or silicic acid. Silicon, which is present in FeSi alloys, is found in the Si (0) and Si (IV) oxidation states. The released substance is rather in the Si(IV) oxidation state. Si(IV) in drinking water or seawater is found in numerous chemical states, such as dissolved monomer Si(OH)_4 , dimer, trimer, colloidal solution or in the form of colloidal clusters of different sizes or in total insoluble lump form. The upper limits of the saturated monomer concentration are around 60-140 mg/l (with temperature control).

Iron:

Dissolved iron is found in the environment in two oxidation states Fe (II/III), while Fe(II) is easily oxidized to Fe(III). Fe (III) normally reacts with water (hydrolysis) to form colloidal and insoluble ferric hydroxide Fe(OH)_3 , which slowly precipitates into sediments under typical water conditions. The formation of ferric hydroxide at pH values above 5.0 limits the presence of iron in water systems. Fe precipitates can adsorb heavy metals and organic matter to a large extent. Fe (III) forms precipitates with phosphates. Iron ions, especially Fe(II), can also be absorbed by dissolved organic material, and thus part of the iron dissolved in natural water bodies can be present in the form of soluble organic complexes.

12.3 Permanence and degradability

It is not established for inorganic substances.

12.4 Bioaccumulative potential

Due to the bioaccumulation potential in the aquatic environment, the study is scientifically unfounded. In general, the true tendency of soluble silica to bioaccumulate in plants is low. Silicon is not known to concentrate or accumulate in soil organisms at levels that are harmful. Terrestrial bioaccumulation of Fe and other relevant metal components of FeSi is low. These elements are not known to accumulate in the terrestrial food chain.

12.5 Results of PBT and vPvB assessment

The substance does not meet the criteria for classification as a PBT or vPvB substance.

12.6 Other adverse effects

No other adverse effects were detected.

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13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Disposal of FeSi must be in accordance with local and national legislation. Unconsumed content of FeSi is to be consumed by the user.

14. TRANSPORT INFORMATION

14.1 Basic information about transportation

Proper expedition
designation: Ferrosilicon

FeSi 45%, 65% and 75% based on the results of tests carried out in Lukaszewicz Instytut Przemysł Organicznego in Warsaw according to the UN N.5 Manual of tests and criteria (Classification certificate Nr/No 056/ Lukaszewicz -IPO-BC/2022), the legal status of the regulation RID/ADR-01.01.2021 **is not subject** to classification in class 4.3 concerning the transport of dangerous goods.

From the point of view of sea transport (IMDG) and air transport (IATA), FeSi 45%, 65%, 75% and 90% is classified in class 4.3, and thus from the point of view of IMDG and ICAO-TI/IATA-DGR it is subject to regulations regarding the transport of dangerous goods.

IMDG and ICAO-TI/IATA-DGR:

Transportable name: Ferrosilicon

UN number: 1408

The class hazards: 4.3

Packaging group: III

14.2 Special preventive measures for the user

Avoid contact of FeSi with water during transport. It is transported in big bags or containers. For bulk material, use tarpaulin-covered trucks to prevent it from coming into contact with water.

15. REGULATORY INFORMATION

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

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.

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RID and ADR regulations regarding the transport of dangerous goods in accordance with 2.2.43.1.7 based on the results of tests carried out in Lukaszewicz Instytut Przemysl Organicznego in Warsaw according to UN N.5 Manual of tests and criteria (Classification certificate Nr /No 056/ Lukaszewicz -IPO-BC/2022), the legal status of the regulation RID/ADR-01.01.2021, this product is not subject to classification in class 4.3 concerning the transport of dangerous goods.

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 has been carried out for the substance . According to the REACH regulation, this substance does not require authorization.

15.2 Chemical safety assessment

There are no special regulations, restrictions and prohibitions.

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.

16.1 List of abbreviations used

COPD:	chronic obstructive pulmonary disease
DNEL:	derived no effect limit
EC ₅₀ :	mean value of the effective concentration
LC ₅₀ :	median value of the lethal concentration
LD ₅₀ :	median lethal dose value

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NOAEC:	no observed adverse effect concentration
NOEC:	no observed effect concentration
OEL:	workplace exposure limit value
PBT:	persistent, bioaccumulative and toxic substances
PNEC:	predicted no-effect concentration
T/D test:	substance solubility test
vPvB:	very persistent, very bioaccumulative substances

16.2 List of changes compared to the previous revision

Change in chapter 14.1 - new Classification certificate Nr /No 056/ Lukasiewicz -IPO-BC/2022), legal status of regulation RID/ADR-01.01.2021 - which declares that this product is not subject to classification in class 4.3 related to the transport of dangerous goods goods.

16.3 Key Resources

This Safety Data Sheet was prepared according to the Chemical Safety Report issued on September 9, 2010.

ANNEX

Table 1 Ways of using the substance or preparation (Use by workers in industry)

C o n f i d e n t i a l	IU no.	Name of Identified Use (IU)	The substance supplied for the given use	Usage Descriptors
	1	Production of FeSi through the melting process in an electric arc furnace (reduction of quartz with carbon)	as such (substance in itself)	<p>Process category (PROC): PROC 3, 4, 5, 8a, 8b, 9, 14, 21, 22, 23</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24.1</p> <p>Is the subsequent life relevant for the given use? yes</p>

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2	Additive for the preparation of: steel or special types of steel (including high permeability steel), alloy bath for incorporation into steel, alloy matrix and alloy powder through spraying.	as such (substance in itself)	<p>Process category (PROC): PROC 1, 3, 4, 5, 8a, 8b, 9, 13, 14, 21, 22, 23, 24, 25, 26, 27a, 27b</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 3, 5, 12a, 12b</p> <p>Sector of use (SU): SU 14, 15 SU 0: Other: NACE code: C24, C24.1</p> <p>Is the subsequent life relevant for the given use? yes</p>
3	Use in the electric arc furnace and in secondary metallurgy / Use in the CASOB process	as such (substance in itself)	<p>Process category (PROC): PROC 2</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14</p> <p>Is the subsequent life relevant for the given use? yes</p>
4	Deoxidation and alloying of steel melts: the stainless steel industry.	as such (substance in itself)	<p>Process category (PROC): PROC 3, 4, 5, 8a, 8b, 9, 22, 23, 25</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 3, 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24+C24.1+C25 up to C33</p> <p>Is the subsequent life relevant for the given use? yes</p> <p>Product category (AC): AC 7</p>
5	Alloying of cast iron charges and melts (iron casting); liquid iron treatment and inoculation and iron casting; pig iron production	as such (substance in itself)	<p>Process category (PROC): PROC 4, 5, 7, 8a, 8b, 9, 10, 12, 15, 20, 22, 23, 26</p> <p>Category of chemical products (PC): PC 7, 14</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24.5</p> <p>Is the subsequent life relevant for the given use? yes</p> <p>Product category (AC):AC 1, 2, 7</p>

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6	Reduction of refractory metals with silicon (Cr, V, Mo) and others (Nb, W)	as such (substance in itself)	<p>Process category (PROC): PROC 3, 4, 5, 8a, 8b, 9, 22, 23, 25</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C 24.1</p> <p>Is the subsequent life relevant for the given use? yes</p>
7	Use as raw material for production FeSiMn or FeSi	as such (substance in itself)	<p>Process category (PROC): PROC 3, 4, 5, 8a, 8b, 9, 20, 22</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24.1+27.1</p> <p>Is the subsequent life relevant for the given use?: yes</p> <p>Product category (AC): AC 2, 7</p>
8	Use for surface treatment of metals	as such (substance in itself)	<p>Process category (PROC): PROC 2, 3, 4, 5, 17, 18, 20, 21, 22, 23, 24, 25</p> <p>Category of chemical products (PC): PC 14</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24</p> <p>Is the subsequent life relevant for the given use? yes</p> <p>Product category (AC): AC 7</p>
9	Use for the production of magnesium from dolomites using the Pidgeon process in electric furnaces; use as metal feedstock in oxygen converters (BOF) (steel industry); Use as a weld metal	as such (substance in itself)	<p>Process category (PROC): PROC: 3, 4, 5, 8a, 8b, 9, 22, 23, 25</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 14 SU 0: Other: NACE code: C24</p> <p>Is the subsequent life relevant for the given use? yes</p>

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10	Substantial FeSi used for the production of refractory products, production of exothermic products	as such (substance in itself)	<p>Process category (PROC): PROC: 3, 4, 5, 8a, 8b, 9, 22, 23, 25</p> <p>Category of chemical products (PC): PC 7, 14</p> <p>Environmental release category (ERC): ERC 3, 5</p> <p>Sector of use (SU): SU 0: Other: NACE code: C23.20 + C24 SU 14</p> <p>Is the subsequent life relevant for the given use? yes</p> <p>Product category (AC): AC 7, 01</p>
11	Liquid iron treatment and inoculation and iron casting. Production of FeSi bricks, use as a powder for the production of filled profiles	as such (substance in itself)	<p>Process category (PROC): PROC: 4, 5, 8a, 8b, 9, 20, 22, 25</p> <p>Category of chemical products (PC): PC 7</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 15 SU 0: Other: NACE code: C24</p> <p>Is the subsequent life relevant for the given use? yes</p> <p>Product category (AC): AC 7</p>
12	Use in arc welding	as such (substance in itself)	<p>Process category (PROC): PROC: 5, 9, 25</p> <p>Category of chemical products (PC): PC 38</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 17 SU 0: Other: NACE code: C24</p> <p>Is the subsequent life relevant for the given use? yes</p>
13	Use as a flotation additive for metal separation through heavy laundry and for the production of welding products	as such (substance in itself)	<p>Process category (PROC): PROC: 26</p> <p>Category of chemical products (PC): PC 0: Other: flotation additive</p> <p>Environmental release category (ERC): ERC 4</p> <p>Sector of use (SU): SU 2a SU 0: Other: NACE code: B7.2.9, + flotation additive</p> <p>Is the subsequent life relevant for the given use? no</p>
14	Mixing in the foundry industry	as such (substance in itself)	<p>Process category (PROC): PROC: 5, 8b, 9</p> <p>Environmental release category (ERC): ERC 5</p> <p>Sector of use (SU): SU 10</p> <p>Is the subsequent life relevant for the given use? yes</p>

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	15	Use as a flotation additive for metal separation through heavy laundry	as such (substance in itself)	<p>Process category (PROC): PROC: 26</p> <p>Category of chemical products (PC): PC 0: Other: flotation additive</p> <p>Environmental release category (ERC): ERC 4</p> <p>Sector of use (SU): SU 10</p> <p>Is the subsequent life relevant for the given use? no</p>
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