PRODUCT SAFETY DATA SHEET for Silicon metal

prepared pursuant to Annex II of the REACH regulation EC 1907/2006 in the valid and effective wording

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

1.1 Product identifier

Trade name
Silicon, silicon refined, silicon standard, silicon metal, Si-metal, metallurgical grade silicon, electronic grade silicon (monocrystalline silicon), solar grade silicon, chemical grade silicon, polycrystalline silicon, silgrain HQ
EC 231-130-8
CAS 7440-21-3

Company product code
Silicon metal

Reach registration number
01-2119480401-47-0050

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

The uses of the chemical
Metal alloy component

The chemical can be used by the general public	Not applicable
The chemical is used by the general public only	Not applicable

1.3 Details of the supplier of the safety data sheet

Manufacturer, importer, other undertaking

Street address	Široká 381, 027 41 Oravský Podzámok, Slovensko
Telephone number	+421/43/5804 111
E-mail address	ofz@ofz.sk

1.4 Emergency Telephone Number

European Emergency No.:112

Emergency Phone No.
at the Company: +421/43/5804 111

Available Outside Office
Hours: No

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

This product does not meet the criteria for hazard classification. Therefore there is no requirements to produce Exposure scenarios for the identified uses of section 1.2 (Art. 14 of REACH).

2.2 Label Elements

No signal word

2.3 Other hazards

See section 10

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Constituents

CAS/EC number and the registration number	Name of the main ingredient	Concentration	Classification under EC 1272/2008
EC 231-130-8	Silicon*	95-100 %	Not classified

* This PSI is based on the Chemical Safety Report of Silicon made according to the qualities covered by the Silicon registration dossier under REACH

3.2 Impurities

This product may contain iron, aluminum, calcium, and titanium dioxide.

4. FIRST-AID MEASURES

4.1 Description of first aid measures

Inhalation: Mechanical irritation caused by dust in the airways: Remove person from Silicon - dust-exposed area.

Skin contact: Wash skin with water and/or a mild detergent.

Eye contact: Rinse eyes with water/saline solution. See a physician upon persistent discomfort.

Ingestion: Remove source of further ingestion. See inhalation.

4.2 Most important symptoms and effects, both acute and delayed

Acute over exposure to dust may cause irritation symptoms like caughing and sore throat, reddening and heavy watering of the eyes. Skin contact can cause reddening and itching of the skin.

4.3 Indication of any immediate medical attention and special treatment needed

No acute danger of poisoning or harm to a human health – the substance is not classified.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Extinguishing media: Dry sand, CO2 or dry powder.
Silicon lumps are not combustible.
Silicon-particles suspended in air, may under certain conditions cause dust explosions.

5.2 Special hazards arising from the substance or mixture

Specific fire & explosion hazards : Although flammability test under REACH (EC guideline) show silicon to be non flammable, small silicon particles (up to 40 micometer) can be ignited and propagate flame that extinguish quickly. The flammability and intensity of the blast increases gradually as particle size decreases.
Addition of wet material to molten Silicon, may cause explosions due to formation of flammable hydrogen gas.

5.3 Advice for firefighters

Not specify.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid handling that generates dust build-up.

6.2 Environmental precautions

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

6.3 Methods and material for containment and cleaning up

Released material should be collected in suitable containers. Damp or wet product must be kept away from dry, and must not be collected and stored in closed containers. Silicon in the form of dry fine dust should be vacuumed, using a spark-proof vacuuming system, rather than swept up.

6.4 Reference to other sections

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid generation of dust. Wear protective clothing, gloves, and goggles. Wear suitable respiratory protection where applicable
Avoid generating sparks or other ignition sources (e.g. welding) in areas with high dust concentrations.
Addition of wet material to molten Silicon may cause explosions due to formation of flammable hydrogen gas.
Avoid reactions with acids like hydrofluoric acid (HF) and nitric acid (HNO3) leading to the formation of toxic gases.

7.2 Conditions for safe storage, including any incompatibilities

Keep dry.

7.3 Specific end use(s)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

National occupational exposure limit values (OEL) : 4 mg / m^3 inhalable dust of silicon

DNEL (Derived No Effect Level): 4 mg/m3 for inhalable silicon
0.3 mg/m3 for respirable silicon

PNEC (Predict No Effect Concentration)
Not relevant

8.2 Exposure controls

Appropriate engineering controls
Dust-free closed systems and local exhaust ventilation for dusty operations.

Eye/face protection
Safety glasses or goggles

Skin protection
Protective clothes

Hand protection
Gloves

Respiratory protection
Dusty work conditions use filtering facepiece respirators (P2/ FFP2).

Thermal hazards
NA

Environmental exposure controls
The Limit values for particles (PM 2.5 and PM 10) of the Ambient Air (Directive 1999/30/EC and its further amendments) have to be implemented.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Appearance	Solid grey crystalline substance. in the form of . lumps, rocks, blocks, ingots, sized material in different grain sizes. Flakes. Briquettes, chunks and chips. Wafers. granules 5 - 120 mm or <50 mm, powders <1.5 mm and jettmilled powders <10 µm
Odour	Odourless
Odour threshold	NA
pH	see solubility

Melting point/freezing point	1414 °C (101,3 kPa)
Initial boiling point and boiling range	2355-3265 °C (101.3 kPa)
Flash point	NA
Evaporation rate	NA
Flammability (solid, gas)	Non flammable
Upper/lower flammability or explosive limits	NA
Vapour pressure	NA
Vapour density	NA
Relative density	2.33 g/cm3 (25 °C)
Solubility(ies)	Water solub. ≤ 46 µg/l at pH 5.7-5.9 (20 °C) crystalline silicon particles; diameter < 1 mm; 45.8 mg Si/l at PH 5.69 (OECD 105)
Partition coefficient: n-octanol/water	NA
Auto-ignition temperature	> 400 °C at 101.3 kPa
Decomposition temperature	NA
Viscosity	NA
Explosive properties	NA
Oxidising properties	NA

9.2 Other Information

No additional information relevant to the safe use of the substance.

10. STABILITY AND REACTIVITY

10.1 Reactivity

Silicon is insoluble in most acids, but dissolves in a mixture of hydrofluoric acid (HF) and nitric acid (HNO3) evolving hazardous gases.

10.2 Chemical stability

Under normal conditions, the product is stable

10.3 Possibility of Hazardous Reactions

Formation of flammable and toxic gases may present hazard in confined, poorly ventilated spaces, especially at elevated temperatures. Addition of wet material to molten metal may cause explosions

10.4 Conditions to Avoid

Avoid dust generating activities and generating sparks and other ignition sources in areas with high dust concentrations.

10.5 Incompatible Materials

Avoid contact with water and moisture and mixing with oxidant products or strong acid or base media.

10.6 Hazardous Decomposition Products

A reaction with hydrofluoric acid (HF) and nitric acid (HNO3) leads to the formation of toxic gases such as silicon tetrafluoride (SiF4) or nitrous gases (NOx).

11. TOXICOLOGICAL INFORMATION

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

Skin corrosion/irritation
Based on available data, the classification criteria are not met.

Serious eye damage/irritation
Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation
Based on available data, the classification criteria are not met.

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

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

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

STOT-single exposure
Based on available data, the classification criteria are not met.

STOT-repeated exposure
Based on available data, the classification criteria are not met.

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

Other information

12. ECOLOGICAL INFORMATION

12.1 Toxicity

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

12.2 Persistence and degradability

Silicon is an inorganic substance and is not biodegradable. The solubility in water is considered low.

12.3 Bioaccumulative potential

No or very low potential for bioconcentration and bioaccumulation.

12.4 Mobility in soil

Particulate silica is immobile substance in soil and sediment.Dissolved silica partitions mainly in aquatic and soil comparaments.

12.5 Results of PBT and vPvB assessment

Silicon is inorganic and it is not classifable as a PBT/vPvB substance.

12.6 Other adverse effects

None known

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose in accordance with all applicable National and Local regulations. Silicon is not listed as hazardous waste in the European List of Waste (Commission Decision 2000/53 and further amendments).

14. TRANSPORT INFORMATION

14.1 UN number

None

14.2 UN proper shipping name

None

14.3 Transport hazard class(es)

IMGD: not classified
ICAO/IATA: not classified
ADR/RID: not classified

14.4 Packing group

N.A.

14.5 Environmental hazards

Silicon is not considered to cause harm to aquatic organisms (Lillicrap, 2011). Silicon is not a marine pollutant.

14.6 Special precautions for user

N.A.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

N.A.

15. REGULATORY INFORMATION

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

The Product Safety Information is prepared in compliance with the following regulations and their further amendments:
- Regulation /EC) No 1907/2006 for Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Regulation (EC) No 1272/2008 on the classification, labelling and packaking of substances and mixtures (CLP).
- Commission Decision 2000/53 of 3 May 2000 establishing a list of wastes pursuant (European List of Wastes)
- Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

15.2 Chemical safety assessment
Chemical Safety Assessment for Silicon has been carried out.

16. OTHER INFORMATION

Other References:

- Silicon Chemical Safety Report
- ECHA Guidance on the compilation of safety data sheets
- Commission Regulation 2015/830 on the requirements fort the Compilation of Safety Data Sheets
- Lillicrap A. Assessment of the Transformation/Dissolution (T/D) Data Generated for Silicon. Norwegian Institute for Water Research. Lab. Testing Report n° 6023-2010, Serial No.O-10158 of March 2011.

These data are based on our current knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationship.

Approved:

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