# Safety Data Sheet

# Silicon

The safety data sheet is in accordance with Commission Regulation (EU) 2020/878 of 18 June 2020 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

## 1. Identification of the substance / mixture and of the company / undertaking

### 1.1. Product Identifier

| | |
|---|---|
| Product name: | Silicon |
| CAS Number | 7440-21-3 |
| EC Number | 230-130-8 |

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

| | |
|---|---|
| Product application: | - Alloying into aluminium,<br>- Production of silicones (siloxanes) via $(CH_3)_2SiCl_2$,<br>- Production of electronic grade silicon via $HSiCl_3$,<br>- Production of synthetic amorphous silica via $SiCl_4$,<br>- Other industrial applications. |

### 1.3. Details of the supplier of the safety data sheet

| | |
|---|---|
| Company name | PCC BakkiSilicon hf |
| Address | Bakkavegur 2<br>640 Húsavík, Iceland |
| Phone number | Phone: +3544640060 |
| Website | www.pcc.is |
| Contact: | pccinfo@pcc.is |
| REACH and CLP helpdesk: | REACH Website:<br>https://echa.europa.eu/home<br>https://echa.europa.eu/support/helpdesks |

### 1.4. Emergency telephone number

| | |
|---|---|
| Iceland | National emergency number: 112<br>Poisons Information Centre: +354 543 2222 |
| Other countries | https://poisoncentres.echa.europa.eu/appointed-bodies |

## 2. Hazards Identification

### 2.1. Classification of the substance or mixture

| | |
|---|---|
| Classification of the substance: | The product does not meet the criteria for hazard classification in accordance with Regulation (EC) No. 1272/2008 (CLP). |

### 2.2. Label elements

| | |
|---|---|
| Hazard pictogram: | N/A (not applicable) |
| Signal word: | N/A (not applicable) |
| Hazard statements: | N/A (not applicable) |
| Precautionary statements: | N/A (not applicable) |

### 2.3. Other hazards

Silicon dust suspended in air may under certain conditions cause dust explosions (See section 10)

## 3. Composition/Information on Ingredients

| Substance | Identification | Classification | Contents |
|---|---|---|---|
| Silicon | CAS No.: 7440-21-3<br>EC No.: 231-130-8 | | > 98.5% |

## 4. First Aid Measures

### 4.1. Discription of first aid measures

| | |
|---|---|
| Inhalation: | Mechanical irritation caused by dust in the airways: Remove person from Silicon - dust-exposed area. |
| Skin contact: | Wash contaminated skin with water and/or mild detergent |
| Eye contact: | Rinse eyes with water/saline solution. If discomfort persists, obtain medical attention. |
| Ingestion: | Remove source of further ingestion. See inhalation. |

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

May cause slight irritation to the skin and eyes.

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

Treat symptomatically

## 5. Fire Fighting Measures

### 5.1. Extinguishing media

Dry sand, CO2 or dry powder.

### 5.2. Special hazards arising from the substance or mixture

Silicon lumps are not combustible.

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.

Addition of wet material to molten Silicon, may cause explosions due to formation of flammable hydrogen gas.

Silicon-particles suspended in air, may under certain conditions cause dust explosions.

The flammability and intensity of the blast increases gradually as particle size decreases.

## 6. Accidental Release Measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid contact with eyes and skin. Use protective equipment as referred to in section 8.

### 6.2. Environmental precautions

Do not allow to enter into sewer, water system or soil. Notify proper authorities in case of contamination of soil or aquatic environment or discharge to drains.

### 6.3. Methods and material for containment and cleaning up

Avoid handling that generates dust build-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

See sections 8 and 13.

## 7. Handling and Storage

### 7.1. Precautions for safe handling

Avoid dust generation. See section 8 for advice on protective equipment.

Avoid ignition sources (e.g. welding) in areas with high dust concentrations.

Addition of wet material to molten silicon may cause explotions. (See section 10).

### 7.2. Conditions for safe storage, including any incompatibilities

Keep product dry and in a well-ventilated area, out of reach of children and away from food, animal feeding stuffs and medicine.

### 7.3. Specific end use(s)

See section 1.2.

## 8. Exposure Controls/Personal Protection

### 8.1. Control Parameters

**Occupational Exposure Limits (OEL)**

| Substance | Identification | Limit value (8h) | Country |
|---|---|---|---|
| Silicon | CAS No.: 7440-21-3 | 0.7 mg/m$^3$ | Iceland |
| | EC No.: 231-130-8 | 0.5 ppm | Iceland |
| | | 10 mg/m$^3$ | Denmark, France, Norway, UK (inhalable fraction) |
| | | 4 mg/m$^3$ | UK (respirable fraction) |
| | | 3 mg/m$^3$ | Switzerland (respirable fraction) |

National occupational exposure limits may vary. Users in other countries than listed in the table must comply with their respective national occupational exposure limits.

**DNEL / PNEC**

| Substance | Identification | DNEL[1] | Comment |
|---|---|---|---|
| Silicon | CAS No.: 7440-21-3 | 0.3 mg/m$^3$ | Respirable fraction |
| | EC No.: 231-130-8 | 4 mg/m$^3$ | Inhalable fraction |

[1]Derived No-effect Level

### 8.2. Exposure Controls

Avoid inhalation of dust. Ensure good ventilation during use. Wear a particulate respirator according to EN 149 FFP 2 during dust generating operations. Use protective gloves and eye protection. Facilities for eye flushing should be available.

  

## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

| | |
|---|---|
| Physical state: | Crystalline |
| Form: | Lump material |
| Colour: | Silvery material |
| Odour: | Odourless. |
| Melting point/freezing point (°C): | Approx. 1410 |
| Boiling point/boiling range | Approx. 2355 |
| Flammability | Nonflammable |
| Lower and upper explosion limit | Not relevant |
| Flash point | Not relevant |
| Auto-ignition temperature | > 400 °C at 101.3 kPa |
| Decomposition temperature | Not available |
| pH | Not relevant |
| Kinematic Viscosity | Not relevant |
| Solubility (Water): | Insoluble/slightly soluble. |
| Solubility (Organic solvents): | Insoluble/slightly soluble. |
| Partition coefficient n-octanol/water | Not relevant |
| Vapour pressure | Not relevant |
| Bulk density (kg/m$^3$): | ≈ 150-700 |
| Density (g/cm$^3$): | Approx 2.3 |
| Relative vapour density | Not relevant |
| Particle characteristics | |
| Specific surface (m$^2$/g): | ≈ 1 |
| Particle size (mm) | 3 - 120 |

### 9.2. Other information

No other information

## 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. Impurities present in silicon (e.g. Al and Ca) may react with dilute acids evolving hazardous gases (see below). Silicon dissolves readily in dilute lye.

### 10.2. Chemical stability

The product is stable under normal temperature conditions and recommended use.

### 10.3. Possibility of hazardous reactions

See section 10.6.

### 10.4. Conditions to avoid

Avoid generating sparks or other ignition sources (e.g. welding) in areas with high dust concentrations. Silicon-particles suspended in air at concentrations above 100 g/m3 can cause dust explosions. Both ignition sensitivity and the violence of explosion increase with decreasing particle size. Silicon dust with particle diameter > 40 µm probably entails no danger of explosion. Ignition temperature (warm surface) ≥ 800 °C. Addition of wet material to molten silicon may cause explosions.

### 10.5. Incompatible materials

Acids (see below).

### 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). Impurities in silicon may react with dilute acids forming flammable and harmful gases such as hydrogen (H2) and silane (SiH4). Wet product will form flammable hydrogen gas if added to molten silicon, due to decomposition of water.

## 11. Toxicological Information

### 11.1. Information on hazard classes as defined in regulation (EC) No 1272/2208

The product does not meet the criteria for hazard classification according to Regulation (EC) No. 1272/2008 (CLP).

Acute effects and symptoms of exposure:

| | |
|---|---|
| Ingestion: | Dust may cause mechanical irritation of nose and dehydration of mucous membranes. |
| Inhalation: | Dust may cause mechanical irritation and dehydration of mucous membranes. Symptoms may include coughing and a sore throat. |
| Skin Contact: | Finely divided dust may cause mechanical irritation and dehydration. Symptoms may include redness and itching. |
| Eye Contact: | Dust may cause mechanical irritation and dehydration. |

Chronic effects:

No chronic effects known.

### 11.2. Information on other hazards

No information on other hazards

## 12. Ecological Information

### 12.1. Toxicity

The product does not meet the classification criteria for ecotoxicological endpoints in accordance with Regulation (EC) 1272/2008 (CLP).

### 12.2. Persistance and degradability

Silicon is an inorganic substance and it is not biodegradable.

### 12.3. Bioaccumulative potential

The inorganic Si species have no tendency or low intrinsic tendency for bioconcentration and bioaccumulation if taken up passively by the species.

### 12.4. Mobility in soil

The product has poor mobility under normal environmental conditions

### 12.5. Result of PBT and vPvP assessment

The substance is not PBT / vPvB

### 12.6. Endocrine disrupting properties

None of the substances listed in section 3.2 are listed on ECHA's Endocrine disruptor assessment list.

### 12.7. Other adverse effects

No information

## 13. Disposal considerations

### 13.1. Waste treatment methods

The material should be recovered for recycling if possible. Dispose of waste product according to applicable federal, state and local rules for non-hazardous solid waste materials. Prior to disposal of large quantities of this material advice should be sought from the local Environment Agency Office.

Do not dispose of into sewage or drains

## 14. Transport information

Not classified as dangerous goods

### 14.1. UN Number or ID number

| | |
|---|---|
| UN number: | Not applicable |
| IMDG/IMO | Not subject to classification |
| ADR/RID | Not subject to classification |
| ICAO/IATA | Not subject to classification |

### 14.2. UN proper shipping name

Not relevant

### 14.3. Transport hazard class(es)

Not relevant

### 14.4. Packing group

Not relevant

### 14.5. Environmental hazards

The product is not considered to cause harm to aquatic organsims (Lillicrap, 2011). Silicon is not marine pollutant.

### 14.6. Special precautions for user

Not relevant

### 14.7. Maritime transport in bulk according to IMO instruments

The product is not transported in bulk

## 15. Regulatory information

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

The text of this Product Safety Information is prepared in compliance with:

− Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) with later amendments.

− Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on Classification, Labelling and Packaging of substances and mixtures (CLP) with later amendments.

### 15.2. Chemical safety assessment

A chemical safety report (CSR) has been carried out for the substance in accordance with Regulation (EC) 1907/2006 (REACH).

## 16. Other information

In accordance with REACH article 31(5), safety data sheets shall be supplied in an official language of the Member State(s) where the substance or mixture is placed on the market. This obligation, however, only applies for hazard-classified products which require a formal SDS. Since this product is not hazard-classified, the product safety information (PSI) is, in accordance with current regulation, provided in English language only.

REACH article 31(7) requires relevant exposure scenarios from the Chemical Safety Report (CSR) to be annexed to the SDS. However, according to REACH Annex I, section 0. (Introduction), subsection 0.6. no 4 and 5, exposure scenarios are only required for hazard-classified substances or mixtures. Since this product is not hazard-classified according to CLP, there is no requirement for exposure scenarios.

Legal Disclaimer: The information given in this sheet is to the best of PCC BakkiSilicon knowledge and believed accurate and reliable as of the date indicated. However, no representation, warranty or guarantee is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use.

This SDS must be made available to all those who handle the product.

| | |
|---|---|
| Abbreviations and acronyms used | EC: European Commission<br>DNEL: Derived no-effect level<br>ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways<br>ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road<br>EWC: European Waste Code (a code from the EU's common classification system for waste)<br>IATA: The International Air Transport Association<br>ICAO: The International Civil Aviation Organisation<br>IMDG: The International Maritime Dangerous Goods Code<br>IMO: International Maritime Organization<br>PBT: Persistent, Bioaccumulative and Toxic<br>RID: The Regulations concerning the International Carriage of Dangerous Goods by Rail<br>UN: United Nations<br>vPvB: very Persistent and very Bioaccumulative |
| Information added, deleted, or revised | This SDS was previously a Product Safety Information (PSI). Sections 1-16 have been revised during the update to SDS. |
| Version | 1 |
| Prepared by | EFLA Consulting Engineers, Lynghals 4, 110 Reykjavík, Iceland |