

1. Identification of the Substance/Preparation and Company

Product name:	Silicon
Application of Silicon:	Alloying into aluminium, production of silicone (siloxanes) via $(\text{CH}_3)_2\text{SiCl}_2$, production of electronic grade silicon via HSiCl_3 ; ceramic material and other industrial applications.
Address/Phone No.:	Elkem ASA, Silicon Products P.O. Box 334 Skøyen N-0213 Oslo, Norway Telephone: + 47 22 45 01 00 https://www.elkem.com/silicon-products/ support.siliconproducts@elkem.com
Contact:	
Emergency Phone No.:	Chemtrec (800) 424-9300

2. Hazards Identification

Classification of the substance	The product does not meet the criteria for hazard classification in accordance with the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS, 9 th rev.) and OSHA's HCS.
Hazard pictogram:	N/A (not applicable)
Signal word:	N/A (not applicable)
Hazard statements:	N/A (not applicable)
Precautionary statements:	N/A (not applicable)

Improper handling of silicon powders can cause deflagration or explosion. (See Section 5).
Silicon should be handled in accordance with National Fire Protection Association recommendations. This product can be handled safely if appropriate handling precautions are followed. This product does not represent a hazard to the environment when handled and stored as advised. (See Section 7).
Flammable and noxious gases may be formed in contact with moisture, acids or bases. (See Sections 10 and 11).
Silicon-dust suspended in air may under certain conditions cause dust explosions. (See section 10).

3. Composition/Information on Ingredients

IUPAC Name:	Silicon
CAS No.:	7440-21-3
EINECS No.:	231-130-8
Purity (weight%)	> 96 %
Balance	metal impurities like iron, calcium, aluminium

4. First Aid Measures

Inhalation: Irritation caused by dust: Fresh air.
Skin contact: Wash skin with water and/or a mild detergent.
Eye contact: Rinse eyes with water/saline solution. See a physician on persistent feeling of discomfort.
Ingestion: Not relevant. Remove the person affected from dust-exposed area. See inhalation.

5. Fire Fighting Measures

Extinguishing media: Dry sand, CO₂ or dry powder.

Lump silicon is not combustible. Dusts of silicon with particle diameter < 75 µm can be ignited and will propagate flame.

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

6. Accidental Release Measures

LAND SPILL:

Silicon spilled on the land represents minimal hazard. Cleanup personnel should wear appropriate respiratory protective equipment when addressing fine material. Avoid the use of compressed air to maneuver spills or leaks of fine material. Fine material should be swept up or vacuumed using explosion-proof equipment. (See Section 7). Keep dry material and wet material separated. Place cleaned up material in disposal container. Avoid repackaging wet materials in sealed containers.

WATER SPILL:

Remove spilled product from water body by dipping or other appropriate means. Avoid repackaging wet materials in sealed containers.

7. Handling and Storage

HANDLING:

Avoid handling that generates dust build-up. (See section 8).

Avoid ignition sources (e.g. welding) in areas with high dust concentrations. Addition of wet material to molten silicon may cause explosions. (See section 10).

STORAGE:

The product must be kept in a dry and well-ventilated place, and away from acids and bases.

8. Exposure Controls/Personal Protection

Occupational exposure controls

Avoid inhalation of dust. Eye protection, eye flushing facilities and protective gloves are recommended. Ensure adequate ventilation. Wear N95 dust masks as respiratory protection (42 CFR 84, CAN/CSA Z94.4-2018) for dust exposure that may exceed exposure limits. If adequate ventilation is not possible, a self-contained breathing apparatus or an air supplied respirator is recommended.



Occupational Exposure Limits (OSHA 29 CFR 1910.1000 TABLE Z-1 and ACGIH¹⁾, 2014):

	8hr TWA (mg/m ³)	
	OSHA PEL	ACGIH1 TLV
Silicon	15 (total)	10 (inhalable, PNOS 2))
	5 (respirable)	3 (respirable, PNOS 2))

¹⁾ American Conference of Governmental Industrial Hygienists

²⁾ Particulates (Insoluble or Poorly Soluble) Not Otherwise Specified. Silicon is considered to be PNOS. Specific TLVs for the individual substances have not been established or have been withdrawn, respectively.

9. Physical and Chemical Properties

Structure	: Crystalline
Form	: powder
Colour	: Silvery material.
Odour	: Odourless.
Solubility (Water)	: Insoluble/slightly soluble.
Melting Point (°C)	: Approx. 1410
Boiling Point (°C)	: Approx. 2355
Specific Gravity (water = 1)	: Approx. 2.3

10. Stability and Reactivity

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

Silicon dissolves readily in dilute lye (NaOH and KOH) and ammonia (NH₃).

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.

Materials to avoid and 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 (NO_x).

The product may also react with other acids, but the reaction with alkaline solutions (see above), gives a more violent reaction (exothermic) developing extremely flammable hydrogen (H₂) gas.

Wet product will form extremely flammable hydrogen gas if added to molten silicon, due to decomposition of water.

11. Toxicological Information

The product does not meet the criteria for classification in accordance with the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS, 9th revision) and OSHA's HCS.

Acute effects:

Inhalation: Dust may irritate and dehydrate mucous membranes.
Skin contact: Dust may irritate and dehydrate skin.
Eye contact: Dust may irritate and lead to dryness.
Ingestion: Dust may irritate and dehydrate mucous membranes.

Chronic effects: No chronic effects known.

Endocrine disrupting properties: The product is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU)2017/2100 or Commission Regulation (EU)2018/605.

12. Ecological Information

The product is not characterised as dangerous for the environment.

MOBILITY: The substance has poor mobility under normal environmental conditions.
PERSISTENCE: Not relevant for metalloids.
BIOACCUMULATION: Not relevant, due to low mobility and non-dispersive use.
ECO-TOXICITY: The product does not meet the classification criteria for ecotoxicological endpoints in accordance with the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS, 9th revision) and OSHA's HCS.

Endocrine disrupting properties: The product is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU)2017/2100 or Commission Regulation (EU)2018/605.

13. Disposal Considerations

Avoid repackaging wet material in sealed containers. Dispose of in accordance with applicable federal, state, and local regulations. Recycle materials when possible. Silicon is not a listed RCRA Hazardous Wastes (40 CFR 261).

14. Transport Information

UN no. None.
IMDG-Code: Not subject to classification.
ICAO/IATA: Not subject to classification.
ADR/RID: Not subject to classification.

DOT (DEPARTMENT OF TRANSPORTATION):
Proper Shipping Name: Not Regulated
I.D. Number and Initials: Not Regulated
Packing Group: Not Regulated
Label(s): Not Regulated

The product described in this SDS has an elemental crystalline structure and is not amorphous. Elkem has determined its silicon products do not smolder or propagate flames when tested according to 49CFR 173.125 and should not be considered Division 4.1 flammable solids.

15. Regulatory Information

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

OSHA: This safety data sheet has been compiled in accordance with the revised Hazard Communication Standard (HCS 2012) and applies GHS classification criteria. Silicon can be considered a nuisance dust and is as such outside the scope of the revised HCS (29 CFR 1910.1200 section (b)(6)(x)).

TSCA (Toxic Substance Control Act):
The product is listed on the TSCA Inventory: ID 14916, CAS # 7440-21-3 (silicon)

CERCLA (Comprehensive Response Compensation, and Liability Act):
Silicon is not listed in 40 CFR 302.4.

RCRA (Resource Conservation/Recovery Act):
Silicon is not a listed hazardous waste.

SARA TITLE III (Superfund Amendments and Reauthorization Act):
311/312 Hazard Categories:
Immediate Health, Delayed Health, Fire.
313 Reportable Ingredients:
None

CALIFORNIA PROPOSITION 65:
This product contains chemical(s) known to the State of California to cause cancer:
None

IARC (International Agency for Research on Cancer):
Not listed.

US-NTP (US National Toxicology Program):
The product is not listed in the 2011 Report on Carcinogens (RoC).

WHMIS (Workplace Hazardous Materials Information System):
not classified.

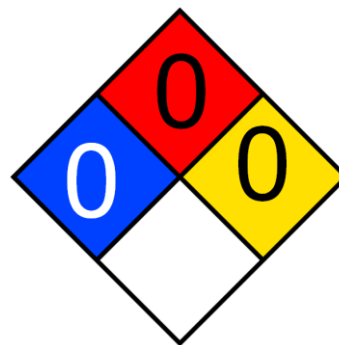
DSL Canada (Domestic Substances List):
Silicon is specified on the public Portion of the Domestic Substances List.

16. Other Information

According to Chapter 1.5.2 of the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS, 9th rev.) safety data sheets (SDS) are only required for substances and mixtures that meet the harmonized criteria for physical, health or environmental hazards. This product does not meet these criteria.

HMIS III (Hazardous Materials Information System)

HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	F (see section 8)



NFPA 704 (National Fire Protection Association)

HEALTH	0
FLAMMABILITY	0
INSTABILITY/REACTIVITY	0
SPECIAL NOTICE	

Legal Disclaimer:

The information given in this sheet is to the best of Elkem's 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.

Literature references are available upon request.

Revision 01: Corporate name updated (ASA), HMIS and NFPA information included, reference to GHS 7th rev.

Revision 02: company info in section 1 updated.

Revision 03: company info updated, new logo, reference to GHS 9th rev, changed formulation risk of dust explosion (2), added risk assessment EDC properties (11 & 12)