

# Safety Data Sheet

Material: 291462

Hyper pure Silicon ingots < 1 % Arsenic

Version: 1.3 (US)

Date of print: 11/18/2019

Date of last alteration: 11/16/2019

## 1. Product and company identification

### 1.1 Identification of the substance or preparation:

**Commercial product name:** Hyper pure Silicon ingots < 1 % Arsenic  
**Use of substance / preparation:** Industrial.  
 Raw material for the production of silicon products

### 1.2 Company/undertaking identification:

**Manufacturer/distributor:** Siltronic AG  
 Johannes-Hess-Straße 24  
 84489 Burghausen  
 Germany

**Customer information:** Siltronic Corporation  
 7200 N.W. Front Avenue  
 Portland, OR 97210-3676  
 USA

**Emergency telephone no. (24h):** (800) 424-9300

**Transportation emergency:** (800) 424-9300 (CHEMTREC, USA)

This SDS was prepared by the Regulatory Affairs and Product Safety Department (RAPS) of Wacker Chemical Corporation.

## 2. Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (GHS):**  
 Not a hazardous substance or mixture.

### 2.2 Label elements

**Labelling (GHS):**  
 No labeling according to GHS required.

### 2.3 Other hazards

Under certain conditions (see sec 10), the product can split off the gases arsine and hydrogen. Arsine shows strong toxic effects by inhalation and is also classified in terms of other physical hazards, health hazards and environmental hazards. Hydrogen is classified in terms of physical hazards.

## 3. Composition/information on ingredients

### 3.1 Chemical characterization (substance)

CAS No.	Chemical characteristics
	Silicon

### 3.2 Information on ingredients:

Type	CAS No.	Substance	Content [wt. %]		Note
			Lower	Upper	
INHA	7440-42-8	Boron			
INHA	7723-14-0	Phosphorus (red)			
INHA	7440-36-0	Antimony			
INHA	7440-38-2	Arsenic			C1, C2, C3

**Type:** HYD - by-product upon hydrolysis, INHA - ingredient, NEBE - by-product, MONO - residual monomer, VERU - impurity, VUL - by-product upon vulcanization. **\*\*\* Note:** C1 - IARC carcinogen, C2 - NTP carcinogen, C3 - OSHA carcinogen, NH - non-hazardous, R - reproductive toxin.

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A tiny amount of boron (CAS-No 7440-42-8), phosphorus (CAS-No 7723-14-0), antimony (CAS-No 7440-36-0), or arsenic (CAS-No 7440-38-2) is included as your requested resistivity.

Substances listed in the Subsections "HAPS" and "California Proposition 65 Carcinogens / Reproductive Toxins" that are not listed in this section are only present at quantities below 0.1% for California Proposition 65 listed toxins or below 1% for non-carcinogenic HAPS or they are inextricably bound in the product. Specific chemical identities and/or exact percentage (concentration) of the composition may have been withheld as a trade secret.

This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57) in amounts above  $\geq 0.1\%$ .

**4. First-aid measures**

**4.1 General information:**

First aid measures only apply to exposure to dust generated by mechanical operations. Get medical attention if irritation or other symptoms occur. Before seeking medical attention remove contaminated clothing and shoes. Take a copy of the Safety Data Sheet when going for medical treatment.

**4.2 After inhalation**

In case of dust/aerosol formation: If inhaled, remove to fresh air.

**4.3 After contact with the skin**

If contact with skin, wash skin with plenty of water or with water and soap.

**4.4 After contact with the eyes**

If contact with eyes, immediately hold eyelids apart and flush with plenty of water for at least 15 min.

**4.5 After swallowing**

For ingestion, if conscious, give several glasses of water but do not induce vomiting. If vomiting does occur, give additional fluids.

**4.6 Advice for the physician**

Treat symptomatically.

**5. Fire-fighting measures**

**5.1 Flammable properties:**

Property:	Value:	Method:
Flash point.....	: not applicable	
Boiling point / boiling range.....	: 2355 °C (4271 °F)	
Lower explosion limit (LEL).....	: not applicable	
Upper explosion limit (UEL).....	: not applicable	
Ignition temperature.....	: not applicable	

**5.2 Fire and explosion hazards:**

Product can separate hydrogen in contact with lyes.

**5.3 Recommended extinguishing media:**

special powder for burning metals or dry sand .

**5.4 Unsuitable extinguishing media:**

water

**5.5 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases**

Hazardous combustion products: silicon dioxide .



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**5.6 Fire fighting procedures:**

Fire fighters should wear full protective clothing including a self-contained breathing apparatus. Cool endangered containers with water.

**6. Accidental release measures**

**6.1 Precautions:**

Wear personal protection equipment (see section 8).

**HAZWOPER PPE Level: D**

**6.2 Containment:**

Observe local/state/federal regulations.

Spills of material which could reach surface waters must be reported to the United States Coast Guard National Response Center's toll free phone number (800) 424-8802.

**6.3 Methods for cleaning up**

Take up mechanically and dispose of according to local/state/federal regulations.

**7. Handling and storage**

**7.1 Handling**

**Precautions for safe handling:**

Keep container closed when not in use. Keep away from incompatible substances in accordance with section 10.

**Precautions against fire and explosion:**

Observe the general rules for fire prevention. Product can separate hydrogen in contact with lyes.

**7.2 Storage**

**Conditions for storage rooms and vessels:**

Observe local/state/federal regulations. Protect against moisture.

**Advice for storage of incompatible materials:**

Keep away from alkalis. Avoid contact with acids.

**Further information for storage:**

Protect against moisture.

**8. Exposure controls and personal protection**

**8.1 Engineering controls**

**Ventilation:**

Use with adequate ventilation.

**Local exhaust:**

In case of dust formation: Local exhaust ventilation which meets the requirements of ANSI Z9.2 is recommended to control airborne contaminants at the point of use.

**8.2 Associate substances with specific control parameters such as limit values**

**Maximum airborne concentrations at the workplace:**

CAS No.	Substance	Type	mg/m <sup>3</sup>	ppm	Dust fract.
7784-42-1	Arsine	OSHA PEL	0.2	0.05	
	Particulates not otherwise classified (insoluble or poorly soluble)	OSHA PEL	15.0		Inhalable dust/mist
	Particulates not otherwise classified (insoluble or poorly soluble)	OSHA PEL	5.0		Respirable dust/mist
7784-42-1	Arsine	ACGIH TWA		0.05	

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	Particulates not otherwise classified (insoluble or poorly soluble)	ACGIH TWA	10.0		Inhalable dust/mist
	Particulates not otherwise classified (insoluble or poorly soluble)	ACGIH TWA	3.0		Respirable dust/mist
7440-38-2	Arsenic	ACGIH TWA	0.01		

Re Particulates not otherwise classified: The value is for particulate matter containing no asbestos and < 1 % crystalline silica (ACGIH).

none known

### 8.3 Personal protection equipment (PPE)

#### Respiratory protection:

Respiratory protection is recommended for dust generating operations such as cutting, grinding, or drilling. A NIOSH approved air purifying respirator fitted with at least P-99 solid/aerosol particulate filters is recommended if overexposure to dust or aerosol mist could occur.

#### Hand protection:

rubber gloves

#### Eye protection:

Safety glasses with side shields.

#### Other protective clothing or equipment:

Additional protective clothing or equipment is not normally required. Provide eye bath and safety shower.

### 8.4 General hygiene and protection measures:

When handling do not eat, drink, smoke or apply cosmetics. Wash thoroughly after handling.

## 9. Physical and chemical properties

### 9.1 Appearance

Physical state .....: solid  
 Form .....: compact  
 Colour .....: silver  
 Odour .....: odourless

### 9.2 Safety parameters

Property:	Value:	Method:
Melting point / melting range.....	1410 °C (2570 °F)	
Boiling point / boiling range.....	2355 °C (4271 °F)	
Flash point.....	not applicable	
Ignition temperature.....	not applicable	
Lower explosion limit (LEL).....	not applicable	
Upper explosion limit (UEL).....	not applicable	
Vapour pressure.....	not applicable	
Density.....	ca. 2.32 g/cm <sup>3</sup>	
Water solubility / miscibility.....	virtually insoluble	
pH-Value.....	not applicable	
Viscosity (dynamic).....	not applicable	
Viscosity (kinematic).....	not applicable	

## 10. Stability and reactivity

### 10.1 General information:

If stored and handled in accordance with standard industrial practices no hazardous reactions are known.

### 10.2 Conditions to avoid

moisture

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### 10.3 Materials to avoid

water , lyes , acids . Reaction causes the formation of: Arsine , hydrogen .

### 10.4 Hazardous decomposition products

If stored and handled properly: none known . Upon contact with the substances mentioned in 10. Arsine , hydrogen .

### 10.5 Further information:

Hazardous polymerization cannot occur.

## 11. Toxicological information

### 11.1 Information on toxicological effects

#### 11.1.1 General information

Data derived for the product as a whole are of higher priority than data for single ingredients.

#### 11.1.2 Acute toxicity

##### Assessment:

For this endpoint no toxicological test data is available for the whole product.

##### Data on substances:

##### Silicon:

Route of exposure	Result/Effect	Species/Test system	Source
Oral	LD50: > 5000 mg/kg	Rat	literature (read-across substance)
dermal	LD50: > 5000 mg/kg	Rabbit	literature (read-across substance)

#### 11.1.3 Skin corrosion/irritation

##### Assessment:

For this endpoint no toxicological test data is available for the whole product.

##### Data on substances:

##### Silicon:

Result/Effect	Species/Test system	Source
not irritating	Rabbit	literature (read-across substance)

#### 11.1.4 Serious eye damage / eye irritation

##### Assessment:

For this endpoint no toxicological test data is available for the whole product.

##### Data on substances:

##### Silicon:

Result/Effect	Species/Test system	Source
not irritating	Rabbit	literature (read-across substance)

#### 11.1.5 Respiratory or skin sensitization

##### Assessment:

For this endpoint no toxicological test data is available for the whole product.

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**Data on substances:**

**Silicon:**

During several years of handling this material, there were no indications of a skin-sensitizing potential.

**11.1.6 Germ cell mutagenicity**

**Assessment:**

For this endpoint no toxicological test data is available for the whole product.

**Data on substances:**

**Silicon:**

Based on known data a significant mutagenic potential may be excluded.

**11.1.7 Carcinogenicity**

**Assessment:**

For this endpoint no toxicological test data is available for the whole product.

**Data on substances:**

**Silicon:**

No data known.

**11.1.8 Reproductive toxicity**

**Assessment:**

For this endpoint no toxicological test data is available for the whole product.

**Data on substances**

**Silicon:**

On the basis of the available data no reproductive hazards are expected. The evaluation is in analogy to a tested product.

**11.1.9 Specific target organ toxicity (single exposure)**

**Assessment:**

For this endpoint no toxicological test data is available for the whole product.

**11.1.10 Specific target organ toxicity (repeated exposure)**

**Assessment:**

For this endpoint no toxicological test data is available for the whole product.

**Data on substances:**

**Silicon:**

No systemic toxicity.

Result/Effect	Species/Test system	Source
NOAEL: 4000 - 5000 mg/kg	Subchronic study rat oral	literature (read-across substance)

**11.1.11 Aspiration hazard**

**Assessment:**

Based on the physical-chemical properties of the product no aspiration hazard must be expected.

**11.1.12 Further toxicological information**

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed



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human carcinogen by IARC. No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

### 12. Ecological information

#### 12.1 Toxicity

**Assessment:**

For the product as a whole, no test data is available. Evaluation on basis of physical-chemical properties: No expected damaging effects to aquatic organisms.

**Data on substances:**

Data derived for the product as a whole are of higher priority than data for single ingredients.

**Silicon:**

No expected damaging effects to aquatic organisms.

#### 12.2 Persistence and degradability

**Assessment:**

For the product as a whole, no test data is available.

**Data on substances:**

**Silicon:**

Separation by sedimentation.

#### 12.3 Bioaccumulative potential

**Assessment:**

No data known.

#### 12.4 Mobility in soil

**Assessment:**

For the product as a whole, no test data is available.

#### 12.5 Results of PBT and vPvB assessment

No data available.

#### 12.6 Other adverse effects

none known

### 13. Disposal considerations

#### 13.1 Product disposal

**Recommendation:**

Observe local/state/federal regulations.

#### 13.2 Packaging disposal

**Recommendation:**

Completely discharge containers (no tear drops, no powder rest, scraped carefully). Empty containers should be sent to an approved recycling facility.



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**14. Transport information**

**14.1 US DOT & CANADA TDG SURFACE**

Valuation .....: Not regulated for transport

**14.2 Transport by sea IMDG-Code**

Valuation .....: Not regulated for transport

**14.3 Air transport ICAO-TI/IATA-DGR**

Valuation .....: Not regulated for transport

**15. Regulatory information**

**15.1 U.S. Federal regulations**

**TSCA inventory status and TSCA information:**

This material or its components are listed on or are in compliance with the requirements of the TSCA Chemical Substance Inventory. This product is considered to be an article and is exempt from regulation.

**TSCA 12(b) Export Notification:**

This material does not contain reportable amounts of any TSCA 12(b) listed chemicals.

**CERCLA Regulated Chemicals:**

This material does not contain any CERCLA regulated chemicals.

**SARA 302 EHS Chemicals:**

This material does not contain any SARA extremely hazardous substances.

**SARA 311/312 Hazard Class:**

This product does not present any SARA 311/312 hazards.

**SARA 313 Chemicals:**

This material does not contain any SARA 313 chemicals above de minimus levels.

**HAPS (Hazardous Air Pollutants):**

CAS No.	Chemical	Upper limit wt. %
7440-38-2	Arsenic	<=0.9999

**15.2 U.S. State regulations**

**California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):**

This material does not contain any chemicals known to the State of California to cause cancer.

This material does not contain any chemicals known to the State of California to cause reproductive effects.

**Massachusetts Substance List:**

7440-21-3 Silicon

**New Jersey Right-to-Know Hazardous Substance List:**

7440-21-3 Silicon

**Pennsylvania Right-to-Know Hazardous Substance List:**

7440-21-3 Silicon

**15.3 Details of international registration status**

Relevant information about individual substance inventories, where available, is given below.

- Japan.....: **ENCS** (Handbook of Existing and New Chemical Substances):  
This product is listed in, or complies with, the substance inventory.
- Australia .....: **AICS** (Australian Inventory of Chemical Substances):  
This product is listed in, or complies with, the substance inventory.



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China .....	<b>IECSC</b> (Inventory of Existing Chemical Substances in China): This product is listed in, or complies with, the substance inventory.
Canada.....	<b>DSL</b> (Domestic Substance List): This product is listed in, or complies with, the substance inventory.
Philippines.....	<b>PICCS</b> (Philippine Inventory of Chemicals and Chemical Substances): This product is listed in, or complies with, the substance inventory.
United States of America (USA).....	<b>TSCA</b> (Toxic Substance Control Act Chemical Substance Inventory): All components of this product are listed as active or are in compliance with the substance inventory.
European Economic Area (EEA).....	<b>REACH</b> (Regulation (EC) No 1907/2006): REACH registration number: 01-21 19480401-47-0220 General note: the registration obligations for substances imported into the EEA or manufactured within the EEA by the supplier mentioned in section 1 are fulfilled by the said supplier. The registration obligations for substances imported into the EEA by customers or other downstream users must be fulfilled by the latter.
South Korea (Republic of Korea).....	<b>AREC</b> (Act on Registration and Evaluation of Chemicals; "K-REACH"): General note: in case of registration obligations for substances or polymers imported into Korea or manufactured within Korea these are fulfilled by the supplier mentioned in section 1. The registration obligations for substances or polymers imported into Korea by customers or other downstream users must be fulfilled by the latter.

**16. Other information**

**16.1 Additional information:**

This Safety Data Sheet (SDS) meets the requirements of the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200). This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief accurate and reliable as of the date compiled. However, no representation, warranty or guarantee expressed or implied, is made as 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. We do not accept liability for any loss or damage that may occur from the use of this information. Nothing herein shall be construed as a recommendation for uses which infringe valid patents or as extending a license under valid patents. This SDS provides selected regulatory information on this product, including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

Vertical lines in the left-hand margin indicate changes compared with the previous version.

**16.2 Glossary of Terms:**

ACGIH - American Conference of Governmental Industrial Hygienists	ppm - Parts per Million
DOT - Department of Transportation	SARA - Superfund Amendments and Reauthorization Act
hPa - Hectopascals	STEL - Short Term Exposure Limit
mPa*s - Milli Pascal-Seconds	TSCA - Toxic Substances Control Act
OSHA - Occupational Safety and Health Administration	TWA - Time Weighted Average
PEL - Permissible Exposure Limit	WHMIS - Canadian Workplace Hazardous Materials Identification System

<b>Flash point determination methods</b> .....	<b>Common name</b>
ASTM D56.....	Tagliabue (Tag) closed cup
ASTM D92, DIN 51376, ISO 2592.....	Cleveland open cup
ASTM D93, DIN 51758, ISO 2719.....	Pensky-Martens closed cup
ASTM D3278, DIN 55680, ISO 3679.....	Setaflash or Rapid closed cup
DIN 51755.....	Abel-Pensky closed cup

**16.3 Conversion table:**

Pressure:..... 1 hPa \* 0.75 = 1 mm Hg = 1 torr; 1 bar = 1000 hPa  
 Viscosity:..... 1 mPa\*s = 1 centipoise (cP)