

SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name SILICON (ELEMENTAL SILICON) (REACH)
Synonyms ELEMENTAL SILICON • SILICON METAL • SIMCOA SILICON
Reach registration 01-2119480401-47-0005

1.2 Uses and uses advised against

Uses INDUSTRIAL APPLICATIONS
Uses advised against None known.

1.3 Details of the supplier of the product

Supplier name SIMCOA OPERATIONS PTY LTD
Address 973 Marriott Rd, Wellesley, WA, 6233, AUSTRALIA
Telephone (08) 9780 6661
Email craigwallis@simcoa.com.au
Website <http://www.simcoa.com.au>

1.4 Emergency telephone numbers

Emergency 0408 901 179

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

2.2 GHS Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

| Ingredient | CAS Number | EC Number | Content | Classification CLP |
|-------------------------------|------------|-----------|---------|---|
| SILICON | 7440-21-3 | 231-130-8 | >98% | Flam. Sol. 2, H228 |
| IRON | 7439-89-6 | 231-096-4 | <3% | |
| ALUMINIUM POWDER (PYROPHORIC) | 7429-90-5 | 231-072-3 | <1.5% | Pyr. Sol. 1, H250 Water-react. 2, H261 |
| CALCIUM | 7440-70-2 | 231-179-5 | <1.5% | Water-react. 2, H261 |
| CARBON | 7440-44-0 | 231-153-3 | <0.1% | |
| TITANIUM | 7440-32-6 | 231-142-3 | <0.1% | |

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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| | |
|-----------------------------|--|
| Inhalation | Mechanical irritation caused by dust in the airways: Remove person from Silicon - dust-exposed area. |
| Skin | Wash skin with water and/or a mild detergent. |
| Ingestion | Remove source of further ingestion. See inhalation. |
| First aid facilities | Eye wash facilities should be available. |

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 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

Non flammable. Silicon lumps are not combustible.

Although flammability test under REACH (EC guidelines) show silicon to be non flammable, small silicon particles (up to 40 micrometre) 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.

Eliminate all ignition sources including cigarettes, open flames, spark producing switches, heaters, naked lights, pilot lights etc. when handling.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. 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

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of 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 for exposure controls and disposal.

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

Store in a cool, dry, well ventilated area, removed from incompatible substances, direct sunlight, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Store in a cool, dry, well ventilated area, removed from oxidising agents, acids, carbonates, halogens, active metals, direct sunlight, heat or ignition sources and foodstuffs.

7.3 Specific end uses

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

| Ingredient | Reference | TWA | | STEL | |
|-----------------------------------|--------------|-----|-------------------|------|-------------------|
| | | ppm | mg/m ³ | ppm | mg/m ³ |
| Aluminium metal (inhalable dust) | WEL [UK] | -- | 10 | -- | -- |
| Aluminium metal (respirable dust) | WEL [UK] | -- | 4 | -- | -- |
| Aluminiumpulver (pyroteknikk) | OEL [Norway] | -- | 5 | -- | -- |
| Iron salts (as Fe) | WEL [UK] | -- | 1 | -- | 2 |
| Silicon (inhalable dust) | WEL [UK] | -- | 10 | -- | -- |
| Silicon (respirable dust) | WEL [UK] | -- | 4 | -- | -- |
| Silisium | OEL [Norway] | -- | 10 | -- | -- |

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. In a laboratory situation use under a fume cupboard or other localised extraction ventilation equipment. Maintain dust levels below the recommended exposure standard.

PPE

- Eye / Face** Wear dust-proof goggles.
- Hands** Wear suitable gloves to ensure adequate hand protection (e.g. PVC, Rubber, Nitrile).
- Body** Coveralls (or suitable protective clothing that covers exposed skin).
- Respiratory** Where an inhalation risk exists, wear a Class P1 - Particulate respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

| | |
|----------------------------------|---------------------------------|
| Appearance | LUSTROUS GREY TO BLACK CRYSTALS |
| Odour | ODOURLESS |
| Flammability | NON FLAMMABLE |
| Flash point | NOT RELEVANT |
| Boiling point | NOT AVAILABLE |
| Melting point | 1420°C |
| Evaporation rate | NOT AVAILABLE |
| pH | NOT AVAILABLE |
| Vapour density | NOT AVAILABLE |
| Relative density | NOT AVAILABLE |
| Solubility (water) | INSOLUBLE |
| Vapour pressure | 1 mm Hg @ 1724°C |
| Upper explosion limit | NOT RELEVANT |
| Lower explosion limit | NOT RELEVANT |
| Partition coefficient | NOT AVAILABLE |
| Autoignition temperature | > 400°C at 101.3 kPa |
| Decomposition temperature | NOT AVAILABLE |
| Viscosity | NOT AVAILABLE |
| Explosive properties | NOT EXPLOSIVE |
| Oxidising properties | NON OXIDISING |
| Odour threshold | NOT AVAILABLE |

9.2 Other information

| | |
|----------------|------------------------|
| Density | 2.33 g/cm ³ |
|----------------|------------------------|

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible (violently) with oxidising agents (e.g. hypochlorites), acids (e.g. nitric acid), halogens (eg chlorine), metal carbonates (eg sodium carbonate), heat and ignition sources. Reacts with water when heated, generating flammable hydrogen gas. Also incompatible with calcium, caesium carbide and alkaline carbonates.

10.6 Hazardous decomposition products

Not expected to evolve hazardous decomposition products.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Animal data on acute toxicity of synthetic amorphous silica which can be used for read-across do not show acute oral, inhalation or dermal toxicity.

Information available for the ingredients:

| Ingredient | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|------------|---------------------|-------------|-----------------|
| IRON | 30000 mg/kg (rat) | -- | -- |
| CARBON | > 2,000 mg/kg (rat) | -- | -- |

Skin Silicon is not a chemical irritant.

Eye Silicon is not a chemical irritant.

Sensitisation Silicon is not considered a respiratory or skin sensitiser.

Mutagenicity Silicon is not mutagenic.

Carcinogenicity Based on available data, silicon is not likely to be carcinogen.

Reproductive Silicon is regarded not to cause fertility effects. Silicon is regarded not to cause developmental toxicity.

STOT - single exposure Insufficient data exists to classify silicon.

STOT - repeated exposure Insufficient data exists to classify silicon.

Aspiration Not relevant.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Silicon is not found as the metallic form in nature, however it does occur widely as silicon dioxide (silica), which is a major component of sand. If the metal is released to the environment, it is expected to slowly oxidise to the inert, non toxic oxide.

12.2 Persistence and degradability

Silicon is an inorganic substance and it is not biodegradable.

12.3 Bioaccumulative potential

Silicon and Si(OH)₄ are generally known to have no or very low potential for bioconcentration and bioaccumulation.

12.4 Mobility in soil

Sorption of dissolved silica in soil/sediments is known to be controlled remarkably by solid phase constituents like clay minerals and oxides and in the lesser extent by solid organic matter.

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12.5 Results of PBT and vPvB assessment

The PBT and vPvB criteria do not apply to inorganic substances, such as silicon metal.

12.6 Other adverse effects

Silicon is not found as the metallic form in nature, however it does occur widely as silicon dioxide (silica), which is a major component of sand. If the metal is released to the environment, it is expected to slowly oxidise to the inert, non toxic oxide.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Reuse where possible, or return to the manufacturer or supplier. Alternatively, dispose of at an approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF ADR, IMDG OR IATA

| | LAND TRANSPORT (ADR / RID) | SEA TRANSPORT (IMDG / IMO) | AIR TRANSPORT (IATA / ICAO) |
|------------------------------------|----------------------------|----------------------------|-----------------------------|
| 14.1 UN Number | None allocated. | None allocated. | None allocated. |
| 14.2 Proper Shipping Name | None allocated. | None allocated. | None allocated. |
| 14.3 Transport hazard class | None allocated. | None allocated. | None allocated. |
| 14.4 Packing Group | None allocated. | None allocated. | None allocated. |

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

15. REGULATORY INFORMATION

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

Classifications None allocated.

Risk phrases None allocated.

Safety phrases None allocated.

Inventory listings **AUSTRALIA: AIIC (Australian Inventory of Industrial Chemicals)**
All components are listed on AIIC, or are exempt.
EUROPE: EINECS (European Inventory of Existing Chemical Substances)
All components are listed on EINECS, or are exempt.

15.2 Chemical safety assessment

No information provided.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

WORKPLACE CONTROLS AND PRACTICES: Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

PRODUCT NAME SILICON (ELEMENTAL SILICON) (REACH)**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

| | |
|-------------------|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| CAS # | Chemical Abstract Service number - used to uniquely identify chemical compounds |
| CNS | Central Nervous System |
| DNEL | Derived No Effect Level |
| EC No. | EC No - European Community Number |
| EMS | Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods) |
| GHS | Globally Harmonized System |
| IARC | International Agency for Research on Cancer |
| LC50 | Lethal Concentration, 50% / Median Lethal Concentration |
| LD50 | Lethal Dose, 50% / Median Lethal Dose |
| mg/m ³ | Milligrams per Cubic Metre |
| OEL | Occupational Exposure Limit |
| PBT | Persistent, bioaccumulative, toxic |
| pH | relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). |
| PNEC | Predicted No Effect Concentration |
| ppm | Parts Per Million |
| REACH | Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals |
| STEL | Short-Term Exposure Limit |
| STOT-RE | Specific target organ toxicity (repeated exposure) |
| STOT-SE | Specific target organ toxicity (single exposure) |
| TLV | Threshold Limit Value |
| TWA | Time Weighted Average |
| vPvB | Very Persistent and Very Bioaccumulative |

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Prepared in accordance with: Annex II of the REACH Regulation (EC) 1907/2006; (CLP) Regulation (EC) 1272/2008; and Regulation (EC) 453/2010 (Amendments to (EC) 1272/2008).

[End of SDS]