

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name SILICON (ELEMENTAL SILICON)
Synonym(s) ELEMENTAL SILICON • SILICON METAL • SIMCOA SILICON

1.2 Uses and uses advised against

Use(s) INDUSTRIAL APPLICATIONS • LABORATORY APPLICATIONS • RAW MATERIAL • REFRACTORY APPLICATIONS

1.3 Details of the supplier of the safety data sheet

Supplier name SIMCOA OPERATIONS PTY LTD
Address 973 Marriott Rd, Wellesley, WA, Australia, 6233
Telephone 08 9780 6661
Fax Not supplied
Email craigwallis@simcoa.com.au
Website http://www.simcoa.com.au

1.4 Emergency telephone number(s)

Emergency 0408901179

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 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
SILICON	7440-21-3	231-130-8	>98%
ALUMINIUM POWDER (PYROPHORIC)	7429-90-5	231-072-3	Not Available
CALCIUM	7440-70-2	231-179-5	Not Available
IRON	7439-89-6	231-096-4	Not Available
POTASSIUM	7440-09-7	231-119-8	Not Available
SODIUM	7440-23-5	231-132-9	Not Available
TITANIUM	7440-32-6	231-142-3	Not Available

4. FIRST AID MEASURES

Product name **SILICON (ELEMENTAL SILICON)**

4.1 Description of first aid measures

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

No information provided.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIREFIGHTING 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.

5.4 Hazchem code

None allocated

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.

Product name **SILICON (ELEMENTAL SILICON)**

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas. 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 use(s)

No information provided.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Substance	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium (metal dust)	SWA (AUS)	--	10	--	--
Aluminium (welding fumes) (as Al)	SWA (AUS)	--	5	--	--
Aluminium, alkyls (NOC+) (as Al)	SWA (AUS)	--	2	--	--
Aluminium, pyro powders (as Al)	SWA (AUS)	--	5	--	--
Aluminium, soluble salts (as Al)	SWA (AUS)	--	2	--	--
Iron oxide fume (Fe ₂ O ₃) (as Fe)	SWA (AUS)	--	5	--	--
Iron salts, soluble, as Fe	SWA (AUS)	--	1	--	--
Silicon	SWA (AUS)	--	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.
- Hand** 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

Product name SILICON (ELEMENTAL SILICON)

Odour	ODOURLESS
Odour Threshold	NOT AVAILABLE
Flammability	NON FLAMMABLE
Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE
Melting Point	1420°C
Evaporation Rate	NOT AVAILABLE
pH	NOT AVAILABLE
Specific Gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour Density	NOT AVAILABLE
Vapour Pressure	1 mm Hg @ 1724°C
Upper Explosion Limit	NOT RELEVANT
Lower Explosion Limit	NOT RELEVANT
Partition Coefficient	NOT AVAILABLE
Autoignition Temperature	NOT AVAILABLE
Decomposition Temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive Properties	NOT AVAILABLE
Oxidising Properties	NOT AVAILABLE

9.2 Other information

Density	2.33 g/cm ³
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information 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.

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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.
Skin	Silicon is not a chemical irritant.
Eye	Silicon is not a chemical irritant.
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.
Sensitisation	Silicon is not considered a respiratory or skin sensitiser.

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.

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 THE ADG CODE, IMDG OR IATA

Product name **SILICON (ELEMENTAL SILICON)**

	Land Transport (ADG)	Sea Transport (IMDG/IMO)	Air Transport (IATA/ICAO)
<u>14.1 UN number</u>	None Allocated	None Allocated	None Allocated
<u>14.2 UN proper shipping name</u>	None Allocated	None Allocated	None Allocated
<u>14.3 Transport hazard classes</u>			
DG Class	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
<u>14.4 Packing group</u>	None Allocated	None Allocated	None Allocated
<u>14.5 Environmental hazards</u>		None Allocated	
<u>14.6 Special precautions for user</u>			
Hazchem Code	None Allocated		

15. REGULATORY INFORMATION

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

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Classifications	None allocated
Risk phrases	None allocated
Safety phrases	None allocated
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

15.2 Chemical safety assessment

No information provided.

16. OTHER INFORMATION

Additional information	<p>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.</p> <p>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.</p> <p>HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: 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 ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.</p> <p>PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective</p>
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equipment is made.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
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
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report Status

This ChemAlert report has been independently compiled by RMT's scientific department utilising the original Safety Data Sheet ('SDS') for the product provided to RMT by the manufacturer. The information is based on the latest chemical and toxicological research 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. It is an independent collation by RMT of information obtained from the original SDS for this product. Its content has not been authorised or verified by the manufacturer / distributor of the chemical to which it relates.

This ChemAlert report does not constitute the manufacturer's original SDS and is not intended to be a replacement for same. It is provided to subscribers of ChemAlert as a reference tool only, is not all-inclusive and does not represent any guarantee as to the properties of the product. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this ChemAlert report, 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 ChemAlert report.

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End of Report