1. IDENTIFICATION

Product Name	**Sodium Silicate Solution (MR 1.6-2.6)**
Other Names	B-Grade; D-Grade; F-Grade
Uses	May be used as a detergent ingredient, adhesive, binder, feedstock silica source; general chemical.
Chemical Family	No Data Available
Chemical Formula	Unspecified
Chemical Name	Silicic acid, sodium salt solution
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Schedule 5

Globally Harmonised System

Hazard Classification		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)	
Hazard Categories		Acute Toxicity (Oral) - Category 5 Skin Corrosion/Irritation - Category 2 Serious Eye Damage/Irritation - Category 1	
Pictograms			
Signal Word		Danger	
Hazard Statements		**H303**	May be harmful if swallowed.
		H315	Causes skin irritation.
		H318	Causes serious eye damage.
Precautionary Statements	Prevention	**P280**	Wear protective gloves/eye protection/face protection.
	Response	**P302 + P352**	IF ON SKIN: Wash with plenty of soap and water.
		P332 + P313	If skin irritation occurs: Get medical advice/attention.
		P362	Take off contaminated clothing and wash before reuse.
		P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
		P312	Call a POISON CENTER or doctor/physician if you feel unwell.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification		NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)	

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	**6.1E**	Substances that are acutely toxic –May be harmful, Aspiration hazard
		6.3A	Substances that are irritating to the skin
		8.3A	Substances that are corrosive to ocular tissue

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Sodium silicate	Unspecified	1344-09-8	30 - 60 %
Water	H2O	7732-18-5	30 - 60 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth thoroughly, then drink plenty of water. Do NOT induce vomiting. Call a Poison Centre or doctor/physician for advice. If vomiting occurs, give/drink water to further dilute the product. Keep victim calm and warm - Obtain immediate medical care.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Call a Poison Centre or doctor/physician for advice. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Obtain immediate medical care.
Skin	IF ON SKIN (or hair): Remove contaminated clothing and shoes immediately. Flush skin and hair with running water for 15 - 30 minutes. In case of gross contamination, drench contaminated clothing and skin with plenty of water before removing clothes. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention.
Advice to Doctor	Treat symptomatically, as for strong alkalis.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Aqueous solution; Product is non-combustible under normal conditions of use.
Extinguishing Media	If material is involved in a fire, use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction - No media identified as unsuitable.
Fire and Explosion Hazard	Flammable hydrogen gas may be produced on prolonged contact with metals, such as aluminium, tin, lead and zinc.
Hazardous Products of Combustion	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium silicate containing mists.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. SCBA and structural firefighter's uniform may provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources. Do not touch or walk through spilled material - Spilled liquids are very slippery; Dries to form glass film which can easily cut skin. Avoid breathing any fumes and contact with eyes, skin and clothing.
Clean Up Procedures	Large spills may be collected using a vacuum truck; Absorb small spills/remaining liquid with earth, sand or other non-combustible material and transfer to a suitable container for disposal (see SECTION 13).
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Isolate, dike and store discharged material, if possible.
Decontamination	Neutralise contaminated area and flush with large quantities of water.
Environmental Precautionary Measures	Avoid release into water systems and sewers.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Avoid generating mists. Avoid breathing any fumes/spray mist and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Take appropriate precautions when handling product whilst hot as it can cause thermal burns. Ensure material is used in an appropriately bunded area to prevent release into soil, water systems and sewers.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep containers closed when not in use - Promptly clean residue from closures with cloth. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store in accordance with all local regulations and codes of practice. - Storage temperature: 0 - 90 °C (avoid prolonged storage above 50 °C or below 10 °C).
Container	Store in clean steel or plastic containers. Do not store in aluminum, fiberglass, copper, brass, zinc or galvanized containers. - Mild steel is the most suitable material of construction for drums, tanks, valves, pipe-work, etc. Concrete storage tanks can be used but must be strong enough to hold the weight of Sodium Silicate Solution to be stored and thick enough to prevent seepage of water.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No exposure standards have been established by Safe Work Australia for the ingredients in this product. An exposure limit of 2 mg/m3 (15 min. TWA) is recommended by analogy with Sodium hydroxide [Manufacturer's recommended limit for good practice].
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Ensure exposure is managed within recommended exposure limits.
Personal Protection Equipment	- Respiratory protection: Respiratory protection is not normally required due to low inhalation risk. If material is likely to be vaporised, the use an approved respirator is necessary. Recommended: Consult a respiratory equipment supplier to aid selection of the appropriate type (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Wear glasses with side shields; If contact with material is likely, the use of chemical resistant goggles in combination with a full face shield is recommended. - Hand protection: Wear protective gloves. Recommended: Wear chemical resistant gloves; If contact is likely, the use of full arm length gauntlets is recommended. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Wear chemical resistant overalls, a full apron or similar protective clothing; Wear appropriate chemical resistant protective boots. The use of barrier cream is recommended.
Special Hazards Precaustions	The use of protective clothing and equipment depends on the degree and nature of exposure. Dried silicate can present physical hazards including cuts and abrasions - Wear cut resistant gloves if handling dried silicate.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Wash contaminated clothing and protective equipment before storing and re-using.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Thick liquid
Odour	Odourless
Colour	Clear to hazy, colourless
pH	11 - 13 (of the concentrate)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	105 - 108 °C

Melting Point	~0 °C
Freezing Point	No Data Available
Solubility	Soluble in water
Specific Gravity	1.2 - 1.6 (typical range)
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	102 - 108 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	20 - 5,000 cps (@ No Data Available)
Volatile Percent	30-60%
VOC Volume	0 %
Additional Characteristics	No information available.
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Aqueous solution; Product is non-combustible under normal conditions of use.
Reactions That Release Gases or Vapours	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium silicate containing mists. May react with ammonium salts resulting in evolution of ammonia gas.
Release of Invisible Flammable Vapours and Gases	Flammable hydrogen gas may be produced on prolonged contact with metals, such as aluminium, tin, lead and zinc.

10. STABILITY AND REACTIVITY

General Information	Absorbs Carbon dioxide on exposure to air, which results in the deposition of insoluble silica. Will react exothermically with acids. Can etch glass if not promptly removed.
Chemical Stability	Stable in sealed containers.
Conditions to Avoid	Avoid leaving solutions exposed to Carbon dioxide in the air. Avoid overheating.
Materials to Avoid	Incompatible/reactive with acids, reactive metals and ammonium salts.
Hazardous Decomposition Products	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium silicate containing mists. Flammable hydrogen gas will form on reaction with aluminium, copper, zinc, etc. May react with ammonium salts resulting in evolution of ammonia gas.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information

- Acute toxicity: May be harmful if swallowed. Swallowing can result in nausea, vomiting, abdominal pain and diarrhoea. May cause severe irritation to the mouth, throat and stomach.
- Skin corrosion/irritation: Causes skin irritation. Human experience confirms that irritation occurs when this material gets on clothes at the collar, cuffs or other areas where abrasion may occur. Prolonged or repeated skin contact may cause dry skin. Defatting of the skin can result in irritation and dermatitis (inflammation of the skin).
- Eye damage/irritation: Causes serious eye damage. May cause conjunctivitis (inflammation of the eyes) and possibly corneal burns and ulceration.
- Respiratory/skin sensitisation: In a mouse local lymph node assay, Sodium metasilicate was not sensitising. In humans, a single case of contact urticaria elicited by sodium silicate is reported.
- Germ cell mutagenicity: From the available evidence, it can be concluded that there is no evidence of a genotoxic potential for soluble silicates.
- Carcinogenicity: The information available does not indicate any potential for carcinogenicity. Sodium Silicate is not listed by IARC, NTP or OSHA as a carcinogen.
- Reproductive toxicity: No indications of reproductive effects for silicates have been reported.
- STOT (single exposure): Exposure to vapours at room temperature is an unlikely route of exposure due to its low vapour pressure. Spray mist will cause respiratory irritation and may result in coughing as well as inflammation of nose, throat and windpipe.
- STOT (repeated exposure): Frequent ingestion over extended periods of time of gram quantities of silicates is associated with the formation kidney stones and other siliceous urinary calculi in humans.
- Aspiration toxicity: No information available.

Acute

Ingestion

Acute toxicity (Oral):
- LD50, Rat: 5,000 mg/kg (Sodium silicate, as 100%).
- LD50, Rat: >3,000 mg/kg (Product, 30-60% Sodium silicate).

SkinIrritant

When tested for primary skin irritation potential, this material produced irritation with a primary irritation index of 3 to abraded skin and 0 to intact skin.

Mutagenicity

In vitro, soluble silicates did not induce gene mutations in bacteria. Sodium silicate was negative in an E. coli reverse mutation. In a guideline study that was performed in accordance with OECD TG 473, an aqueous sodium silicate solution (36% active; MR 3.3) induced no chromosomal aberrations in Chinese hamster V79 cells.

Reproduction

In a developmental toxicity study, pregnant mice were administered 12.5, 50 or 200 mg/kg bw/d Sodium metasilicate in aqueous solution from day 0 until 17/18 of gestation by daily gavage. Litter size and fertility index were unaffected at concentrations up to and including 200 mg/kg bw/d. Furthermore, no developmental effects were observed up to and including 200 mg/kg bw/d.

Carcinogen Category

None

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute toxicity testing in fish, invertebrates and algae indicate a low order of toxicity. The soluble silicates exhibit aquatic toxicities in excess of 100 mg/l irrespective of molar ratio or metal cation.

Persistence/Degradability

This material is not persistent in aquatic systems, but its high pH when undiluted or unneutralised is acutely harmful to aquatic life. Diluted material rapidly depolymerises to yield dissolved silica in a form that is indistinguishable from natural dissolved silica. It does not contribute to BOD.

Mobility

Expected to be mobile in soil. Soluble in water/Sinks and mixes with water. Only water will evaporate from this material.

Environmental Fate

Avoid contaminating waterways.

Bioaccumulation Potential

This material does not bioaccumulate except in species that use silica as a structural material such as diatoms and siliceous sponges. Neither silica nor sodium will appreciably bioconcentrate up the food chain.

Environmental Impact

No Data Available

13. DISPOSAL CONSIDERATIONS

General Information

Dispose of contents/container in accordance with local/regional/national regulations. Normally suitable for disposal at approved land waste site after dilution or neutralisation. Not suitable for incineration.

Special Precautions for Land Fill

No information available.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)
US DOT

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available

Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport
IMDG Code

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport
IATA DGR

Proper Shipping Name	Sodium Silicate Solution (MR 1.6-2.6)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Schedule 5

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR002503

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined

Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	SODSIS5000, SODSIS5100, SODSIS5300, SODSIS6000, SODSIS6500
Revision	1
Revision Date	08 Nov 2017
Reason for Issue	sds updated
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius **EPA (New Zealand)** Environmental Protection Authority of New Zealand **deg F (°F)** Degrees Farenheit **g** Grams **g/cm³** Grams per Cubic Centimetre **g/l** Grams per Litre **HSNO** Hazardous Substance and New Organism **IDLH** Immediately Dangerous to Life and Health **immiscible** Liquids are insoluable in each other. **inHg** Inch of Mercury **inH2O** Inch of Water **K** Kelvin **kg** Kilogram **kg/m³** Kilograms per Cubic Metre **lb** Pound **LC50** LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. **LD50** LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. **ltr** or **L** Litre **m³** Cubic Metre **mbar** Millibar **mg** Milligram **mg/24H** Milligrams per 24 Hours

mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight