Safety Data Sheet RANKINE SO2 INDICATOR SOLUTION

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SECTION 1: Identification

GHS Product identifier

Product name	RANKINE SO2 INDICATOR SOLUTION

Recommended use of the chemical and restrictions on use

Rankine SO2 apparatus.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Flammable liquids, Cat. 3

GHS label elements, including precautionary statements

Pictograms

Signal word	**Warning**
Hazard statement(s)	
H226	Flammable liquid and vapor
Precautionary statement(s)	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P403+P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Components

Component	CAS no.	Concentration
Ethanol (EC no.: 200-578-6; Index no.: 603-002-00-5)	**64-17-5**	**49.5 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2. HAZARDS: H225 - Highly flammable liquid and vapor.		
Water (EC no.: 231-791-2)	**7732-18-5**	**49.5 % (weight)**
CLASSIFICATIONS: No data available. HAZARDS: No data available.		
Methyl Red Sodium salt (EC no.: 212-682-9)	**845-10-3**	**1 % (weight)**
CLASSIFICATIONS: No data available. HAZARDS: No data available.		
Methylene Blue anhydrous (EC no.: 200-515-2)	**61-73-4**	**0.5 % (weight)**
CLASSIFICATIONS: Acute toxicity, oral, Cat. 4. HAZARDS: H302 - Harmful if swallowed.		

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice	First Aid Facilities: Maintain eyewash fountain and drench facilities in work area.
If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Immediately obtain medical aid if cough or other symptoms appear
In case of skin contact	Immediately remove contaminated clothing and wash affected area with water for at least 15 minutes. Ensure contaminated clothing is washed before re-use. Seek medical advice /attention depending on the severity.

In case of eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open.In all cases of eye contamination it is a sensible precaution to seek medical advice
If swallowed	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical advice if effects persist.

Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary
Treat symptomatically based on judgement of doctor and individual reactions of the patient.

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Caution: Use of water spray when fighting fire may be inefficient.
Small fire: Use foam, dry chemical, CO2 or water spray.
Large fire: Use foam, fog or water spray - Do not use water jets.
If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until well after fire is out.
Avoid getting water inside containers.

Specific hazards arising from the chemical
Oxides of carbon, nitrogen and sulfur.

FLAMMABLE: - Will be easily ignited by heat, sparks or flames at ambient temperatures. Vapours will form explosive mixtures with air. Vapours will travel to source of ignition and flash back. Fire may produce irritating, poisonous and/or corrosive gases. Containers may explode when heated. Many liquids are lighter than water. Many vapours are heavier than air and will collect in low or confined areas (drains, basements, tanks). Vapours from run-off may create an explosion hazard.

Special protective actions for fire-fighters
Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. Fight fire from safe location.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

Methods and materials for containment and cleaning up
ELIMINATE all ignition sources (no smoking, flares, sparks or flame) within at least 50m - All equipment used in handling the product must be earthed.
Do not touch or walk through spilled material.
Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas.
Vapour-suppressing foam may be used to control vapours.
Absorb spill with earth, sand or other non-combustible material - Use clean, non-sparking tools to collect material and place it in loosely-covered metal or plastic containers for later disposal. Water spray may be used to knock down or divert vapour clouds.

SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

SECTION 7: Handling and storage

Precautions for safe handling
Avoid ingestion and inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Use only in a well-ventilated area. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Keep container tightly closed. Keep away from heat, sparks and flame. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous.

Conditions for safe storage, including any incompatibilities
Flammables-area. Store in tightly closed containers, in a cool, dry, well-ventilated area, away from incompatible substances. Keep away from heat and all sources of ignition (sparks and flame). Keep from contact with oxidizing materials. Do not store near perchlorates, peroxides, chromic acid or nitric acid.

Corrosiveness: Ethanol is not corrosive to cast iron, steel stainless steel, copper and its alloys, nickel and its alloys and aluminium. May react with hot aluminium.

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against
chemicals should comply with AS 3765 Clothing for Protection Against Hazardous
Chemicals.

Hand Protection: Ensure hand protection complies with AS 2161, Occupational protective gloves - Selection, use and maintenance.

Body protection
Footwear: Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection: Clean clothing or protective clothing should be worn, preferably with and apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Respiratory protection
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Liquid
Appearance	Blue solution.
Color	No data available.
Odor	Ethanolic odour.
Odor threshold	Ethanol: 49-716 ppm (geometric mean: 180 ppm) (detection); 100 ppm (recognition).
Melting point/freezing point	-37 °C
Boiling point or initial boiling point and boiling range	78 - 80°C
Flammability	No data available.
Lower and upper explosion limit/flammability limit	Flammable Limits - Lower: 2.0 vol % Flammable Limits - Upper: 12.0 vol%
Flash point	27 °C
Explosive properties	Can release vapours that form explosive mixtures at temperatures above the flashpoint. Containers may explode in the heat of a fire.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Oxidizing properties	No data available.
pH	No data available.
Kinematic viscosity	No data available.
Solubility	Solubility in Water: Soluble. Solubility in Organic Solvents: Easily soluble in n-octanol. Soluble in methanol, diethyl ether, acetone.
Partition coefficient n-octanol/water (log value)	No data available.
Vapor pressure	Ethanol: 5.9 kPa (44.3 mm Hg) at 20 °C.
Evaporation rate	>1 (ether=1)
Density and/or relative density	[14] Specific Gravity: ~0.8
Relative vapor density	Ethanol: 1.59.
Particle characteristics	No data available.

Supplemental information regarding physical hazard classes
No data available.

Further safety characteristics (supplemental)
[HF] Saturated Vapour Concentration: Ethanol: 58300 ppm (5.8%) at 20 °C (calculated)

SECTION 10: Stability and reactivity

Reactivity
Risk of ignition. Vapours may form explosive mixtures with air

Chemical stability
Stable under normal temperatures and pressures.

Possibility of hazardous reactions
Vapours may form explosive mixture with air.

Hazardous Polymerization: Will not occur.

Conditions to avoid
Incompatible materials, ignition sources, excess heat, oxidizers.

Incompatible materials
Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium-tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane + water, acetyl chloride, permanganic acid, ruthenium (VIII) oxide, uranyl perchlorate, potassium dioxide.

Hazardous decomposition products
Irritating and toxic fumes and gases, oxides of sulfur, carbon, nitrogen and sodium, sodium, hydrogen bromide and phenols.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Acute Toxicity - Oral: LD50 (rat): 7060 mg/kg; 10600 mg/kg; 13660 mg/kg - Ethanol;
LD50 (mouse): 3450 mg/kg - Ethanol;
LD50 (guinea pig): 5560 mg/kg - Ethanol.

Acute Toxicity - Inhalation: LC50 (mouse): Approximately 21000 ppm/ 4 h; cited as 39 g/m^3 /4 h - Ethanol.

Ingestion: May cause central nervous system depression, kidney damage, and liver damage. May cause gastrointestinal irritation with nausea, vomiting and diarrhoea. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentrations. Vapours may cause dizziness or suffocation.

Skin corrosion/irritation
Causes moderate skin irritation. May be absorbed through the skin. May cause cyanosis of the extremities.

Skin corrosion/irritation: Draize test, rabbit, skin: 20 mg/24 h Moderate. Ethanol

Serious eye damage/irritation
Causes severe eye irritation. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage.

Serious eye damage/irritation: Draize test, rabbit, eye: 500 mg/24 h Mild - Ethanol.

Respiratory or skin sensitization
Skin Sensitisation: Sensitisation test (Magnusson and Kligman): negative - Ethanol.

Germ cell mutagenicity
Ethanol: A mutagenic effect has been demonstrated in animal studies on mammals, justifying the assumption that exposure of humans to the substance may produce hereditary damage.

Carcinogenicity
No data available.

Reproductive toxicity
Ethanol: Effects on reproductive organs, including decreased testicular weight, decreased numbers of motile sperm, decreased ovarian function and irregular fertility cycles, have been observed in animals given large oral doses of ethanol. However, no confirmed effects on

fertility or reproductive capability have been observed. In a well-conducted continuous breeding study, mice were exposed to 5, 10 or 15% ethanol in water (approximately 8500, 16000 and 20000 mg/kg/day). No effects on fertility and only minor reproductive effects were observed (reduced sperm motility and increased time between litters). Male and female rats with inhalation exposure to 10000 or 16000 ppm ethanol for 6 weeks prior to mating showed no effect on fertility.

Specific target organ toxicity (STOT) - single exposure
No data available.

Specific target organ toxicity (STOT) - repeated exposure
No data available.

Aspiration hazard
No data available.

Additional information
Chronic Effects: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumours. Prolonged exposure may cause liver, kidney, and heart damage.

Methylene Blue anhydrous: cat LDLo intravenous 41mg/kg (41mg/kg) Annals of Internal Medicine. Vol. 7, Pg. 738, 1933.
dog LDLo intravenous 50mg/kg (50mg/kg) "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." Vol. 4, Pg. 1366, 1935.
dog LDLo oral 500mg/kg (500mg/kg) "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." Vol. 4, Pg. 1366, 1935.
domestic animals - goat/sheep LD50 intravenous 42300ug/kg (42.3mg/kg) Journal of Veterinary Pharmacology and Therapeutics. Vol. 7, Pg. 225, 1984.
Link to PubMed
guinea pig LDLo subcutaneous 300mg/kg (300mg/kg) "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." Vol. 4, Pg. 1366, 1935.
infant TDLo unreported 15mg/kg (15mg/kg) LUNGS, THORAX, OR RESPIRATION: CYANOSIS

BLOOD: OTHER CHANGES "Toxicology of Drugs and Chemicals," Deichmann, W.B., New York, Academic Press, Inc., 1969Vol. -, Pg. 390, 1969.
man TDLo subcutaneous 28uL/kg (0.028mL/kg) SKIN AND APPENDAGES (SKIN): "DERMATITIS, OTHER: AFTER SYSTEMIC EXPOSURE" British Journal of Clinical Practice. Vol. 28, Pg. 289, 1974.
Link to PubMed
monkey LDLo intravenous 10mg/kg (10mg/kg) "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." Vol. 4, Pg. 1366, 1935.
mouse LD50 intraperitoneal 150mg/kg (150mg/kg) National Technical Information Service. Vol. AD691-490,
mouse LD50 intravenous 77mg/kg (77mg/kg) Cesko-Slovenska Farmacie. Vol. 12, Pg. 94, 1963.
Link to PubMed
mouse LD50 oral 3500mg/kg (3500mg/kg) Cesko-Slovenska Farmacie. Vol. 12, Pg. 94, 1963.
Link to PubMed
rabbit LDLo oral 1gm/kg (1000mg/kg) "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." Vol. 4, Pg. 1366, 1935.
rat LD50 intraperitoneal 180mg/kg (180mg/kg) Naunyn-Schmiedeberg's Archiv fuer Experimentelle Pathologie und Pharmakologie. Vol. 204, Pg. 288, 1947.
rat LD50 intravenous 1250mg/kg (1250mg/kg) Arzneimittel-Forschung. Drug Research. Vol. 18, Pg. 676, 1968.
Link to PubMed
rat LD50 oral 1180mg/kg (1180mg/kg) "Prehled Prumyslove Toxikologie; Organicke Latky," Marhold, J., Prague, Czechoslovakia, Avicenum, 1986Vol. -, Pg. 1334, 1986.
rat LD50 subcutaneous 190mg/kg (190mg/kg) Drugs in Japan Vol. -, Pg. 1185, 1990.

SECTION 12: Ecological information

Toxicity
Acute Toxicity - Fish: L.idus LC50: 8140 mg/l /48 h.

Acute Toxicity - Daphnia: Daphnia magna EC50: 9268-14221 mg/l /48 h.

[8Z] Acute Toxicity - Algae: Maximum permissible toxic concentration: Algeal toxicity: Sc.quadricauda IC5: 5000 mg/l /7 d.

[90] Acute Toxicity - Bacteria: Maximum permissible toxic concentration: Bacterial toxicity: Ps.putida EC5: 6500 mg/l /16 h.

[91] Acute Toxicity - Other Organisms: Maximum permissible toxic concentration: Protozoa: E.sulcatum EC5: 65 mg/l /72 h.

Persistence and degradability
Ethanol: Abiotic degradation: Rapid degradation. (air)
Biologic degradation: Biodegradation: 94 % modified OECD screening test;
Readily biodegradable.
Further ecologic data: BOD: 0.93-1.67 g/g; COD: 1.99 g/g; ThOD: 2.10 g/g; BOD 74 % of ThOD /5 d; COD 90 % of ThOD.

Bioaccumulative potential
No bioaccumulation is to be expected (log P(o/w <1) (ethanol).

Mobility in soil
Distribution: log P(oct): -0.32 (ethanol).

SECTION 13: Disposal considerations

Disposal methods

Product disposal
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Sewage disposal
No bioaccumulation is to be expected (log P(o/w <1) (ethanol).

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1993
Class: 3
Packing Group: II
Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (Contains ethanol)

Hazchem emergency action code (EAC)
•3YE

IMDG
UN Number: 1993
Class: 3
Packing Group: II
EMS Number:
Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (Contains ethanol)

IATA
UN Number: 1993
Class: 3
Packing Group: II
Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (Contains ethanol)

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: NS

SECTION 16: Other information

Further information/disclaimer
ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Preparation information
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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)