AFROX
A Member of The Linde Group

SAFETY DATA SHEET (SDS)
Sulphur Dioxide
Please ensure that this SDS is received by the appropriate persons

Review Date: 29/10/2021 v01 **Emergency: 0860 02 02 02** **Document Number: AFX-SDS-0068**

1. PRODUCT AND COMPANY IDENTIFICATION

Product Synonym
Sulphur Dioxide
Sulphurous Acid Anhydride

Chemical Formula
SO_2

Trade Name
Sulphur Dioxide N3.0

Colour Coding
Brunswick green (H.O7) body with a Golden yellow (B49) shoulder

Product Code
540901-LJ-N
540901-TB-N
540902-LJ-C

Company Identification
African Oxygen Limited
Grayston Office Park Building 7
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Emergency Numbers
0860 02 02 02 (Afrox)

2. HAZARD IDENTIFICATION

Classification
- Classification under South African Hazardous Chemical Substances Regulations subsequently amended. (HCS)
- Classification under the Globally Harmonized System of classification and labelling of chemicals (GHS)

Emergency Overview
Colour: None
Odour: Pungent, Sulphurous
Taste: Acidic
Physical State: Compressed Gas
Form:Gas under pressure

Main Hazards
- All cylinders are portable gas containers and must be regarded as pressure vessels at all times. Sulphur dioxide is a highly irritating gas; it readily elicits respiratory reflexes. It is intensely irritating to the eyes, throat, and respiratory tract.

Adverse Health Effects
- Inhalation of this gas in concentrations of 8-12ppm in air causes throat irritation, coughing, constriction of the chest, lacrimation, and smarting of the eyes.
- A concentration of 150 ppm can be endured only a few minutes, because of eye irritation and the effect on the membranes of the nose, throat and lungs.
- Exposure to a concentration of 500 ppm by volume in air for a few minutes is very dangerous.

Chemical Hazards
- Sulphur dioxide dissolves in water forming sulphurous acid, which is unstable toward heat. In many of its reactions, sulphur dioxide behaves as a reducing agent.

Biological Hazards
- Liquid Sulphur dioxide may cause skin and eye burns upon contact with these tissues, which results from the freezing effect of the liquid on the skin or eyes. Low (1%) concentrations of the vapour are irritating to moist skin within a period of 3 minutes

Vapour Inhalation
- Acute exposure through inhalation may result in dryness and irritation of the nose and throat, choking, sneezing, coughing, and bronchospasm. Severe overexposure may cause death through systemic acidosis, from pulmonary oedema, or from respiratory arrest.

Eye Contact
- Corneal burns, opacification of the cornea, and blindness may result if liquid Sulphur dioxide is splashed in the eyes. Sulphur dioxide can penetrate the intact cornea and cause iritis.

Skin Contact
- Liquid sulphur dioxide can cause frostbite and skin burns, and it converts to sulphurous acid in moist environments, which may cause skin irritation.

Ingestion
- Severe burns to the mouth, throat, and gastrointestinal system may occur.

GHS Classification
- Acute Toxicity, Inhalation (Category 3)
- Skin Corrosion/Irritation (Category 1)
- Eye Damage/Irritation (Category 1)
- Gas under pressure (Liquefied gas)

GHS Pictogram

GHS Signal Words
Danger

GHS Hazard Statements
- H280: Contains gas under pressure, may explode if heated
- H331: Toxic if inhaled
- H314: Causes severe skin burns and eye damage

GHS Precautionary Statements

Storage:
- P410+P403 : Protect from sunlight and store in a well-ventilated place.
- P403 + P233 : Store in a well-ventilated place. Keep container tightly closed.
- P405 : Store locked up.

Prevention:
- P261 : Avoid breathing fume, gas, mist, or vapours.
- P271 : Use only outdoors or in a well-ventilated area.
- P264 : Wash skin thoroughly after handling.
- P280 : Wear protective gloves, protective clothing, eye protection and face protection.

Response:
- P301 + P330 – If Swallowed: Rinse mouth. Do not induce vomiting.
- P304 + P340 : IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305 + P351 + P338 : If in Eyes: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 : Immediately call a POISON CENTRE/doctor
- P321 : Specific treatment (see FIRST AID MEASURES on this sheet)
- P303 + P361 + P353 : If on Skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- P363 : Wash contaminated clothing before reuse.

Disposal
- Dispose of contents in accordance with local, regional, national and international regulations.

Other Hazards that do not result in classification
- Corrosive to the respiratory tract
- Contact with evaporating liquid may cause frostbite or freezing of skin.

3. COMPOSITION OF INGREDIENTS

Chemical name	Sulphur Dioxide (SO_2)
Chemical family	Inorganic, acidic gas
CAS No	7446-09-5
UN No	1079
ERG No	125
Hazard class	2.3
Hazchem Warning	Toxic and corrosive gas

4. FIRST AID MEASURES

Eye contact
- Immediate medical attention is required.
- Immediately flush eyes with running water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Keep eyes wide open while rinsing. Do not rub affected area.

Skin Contact
- Immediate medical attention is required.
- Immediately flush skin with plenty of water for at least 30 minutes. Remove contaminated clothing and shoes.
- Instant-acting safety showers should be available in convenient locations.

Ingestion
- Not an expected route of exposure

Inhalation
- Immediate medical attention is required.
- Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen.
- If breathing has stopped, give artificial respiration, it may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Any physical exertion during this period should be discouraged as it may increase the severity of the pulmonary edema or chemical pneumonitis. Bed rest is indicated.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
- As sulphur dioxide is non-flammable, the correct extinguishing media should be used for the surrounding fire

Unsuitable extinguishing media:
- None

Specific Hazards
- Water should not be sprayed at or into a tank or system which is leaking sulphur dioxide. The presence of water causes sulphur dioxide to be very corrosive, and water directed into a tank would also increase the venting rate. Keep run-off water out of sewers and water sources.

Special fire fighting procedures:
- A sulphur dioxide container exposed to a fire should be removed. If for any reason it cannot be removed, the container should be kept cool with a water spray until well after the fire is out.
- CONTACT LOCAL EMERGENCY SERVICES AND THE AFROX EMERGENCY NUMBER.

Special protective equipment for firefighters:
- Exposed fire fighters should wear approved Gas tight chemically protective clothing in combination with self contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
- It is essential that every facility handling sulphur dioxide has an emergency plan outlining the actions that employees should take in case of specific emergencies. These actions should include alerting fellow employees and area emergency control groups of the nature and extent of the emergency. The plan should also include co-ordination procedures with area emergency control groups in the event of a major release.
- Evacuate area.
- Contact emergency services
- Provide adequate ventilation. Monitor the concentration of the released product.
- Prevent persons from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. All persons not so equipped must leave the affected area until the leak has been stopped.

Environmental Precautions
- Prevent further leakage or spillage if safe to do so. Reduce vapour with fog or fine water spray. Keep run-off water out of sewers and water sources. Bunding or dyke for water control.
- When sulphur dioxide is released to the environment, the appropriate regulatory agency should be notified. In the event of a

release however, provincial, municipal, and/or local reporting regulations must be complied with. It is most important that the response groups in the area affected be notified as quickly as possible.

Methods and material for containment and cleaning up:

- Sulphur dioxide is fairly soluble in cool water and therefore the vapour concentration can be reduced by the use of spray or fog nozzles.
- If disposal of sulphur dioxide becomes necessary, such as from a leaking container or vessel, it can be vented into a lime or caustic soda solution.
- The resulting salt solution should be taken to a plant treating unit for neutralisation and disposal.

7. HANDLING AND STORAGE

Safe Handling

- Only experienced and properly instructed persons should handle gases under pressure. Avoid exposure - obtain special instructions before use. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Installation of a cross purge assembly between the container and the regulator is recommended. Excess pressure must be vented through an appropriate scrubber system. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow back feed into the container. Avoid suck back of water, acid and alkalis. Keep container below 50°C in a well-ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps were supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place. Use the “first in - first out” inventory system to prevent full cylinders from being stored for excessive periods of time.

Conditions for safe storage, including any incompatibilities

- Containers should not be stored in conditions likely to encourage corrosion. Keep away from food, drink and animal feeding stuffs. Stored containers should be
- periodically checked for general conditions and leakage. Container valve guards
- or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Occupational Exposure Hazards (HCS)

- TWA 2 ppm
- STEL (15 minutes) 5 ppm
- IDLH 100 ppm
- Prolonged or repeated exposure may cause impaired lung function, bronchitis, hacking cough, nasal irritation and discharge, increased fatigue, alteration in the sense of taste and smell, and longer duration of common colds.

Engineering Control Measures

- Engineering control measures are preferred to reduce exposures. General methods include mechanical ventilation, process or personal enclosure, and control of process conditions. Administrative controls and personal protective equipment may also be required.

A Risk assessment should be conducted to evaluate the suitability of PPE to the task being performed

Personal Protection

- Use an approved gas mask or self-contained breathing apparatus when entering a sulphur dioxide contaminated area

Eyes

- Provide readily accessible eye wash stations and safety showers. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible.

	- Wear eye protection to EN 166 when using gases.
Hands	- Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products.
Body protection:	- Keep suitable chemically resistant protective clothing readily available for emergency use. Guideline: EN 943 Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles.
Feet	- Wear safety shoes while handling containers

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	**Sulphur Dioxide**
Chemical Symbol	SO_2
Physical state	Gas
Form:	Liquefied gas
Colour:	Colourless
Odour:	biting/sulphuric
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over-exposure.
pH:	Not applicable.
Melting Point:	-75.5 °C Other, Key study
Boiling Point:	-10.05 °C (101.325 kPa) Other, Key study
Sublimation Point:	Not applicable.
Critical Temp. (°C):	157.5 °C
Flash Point:	Not applicable
Evaporation Rate:	Not applicable.
Flammability (solid, gas):	Non-flammable Gas
Flammability limit - upper (%):	Not applicable.
Flammability limit - lower(%):	Not applicable.
Vapour pressure:	3,271 hPa (20 °C) Other, Key study
Vapour density (air=1)	2.263 (0 °C) AIR=1
Relative density:	2.26
Solubility(ies)	
Solubility in Water:	Completely soluble in water
Solubility (other):	water: 0.113 g/ml (20 °C)
Partition coefficient (n-octanol/water):	Not applicable
Autoignition Temperature:	Not applicable.
Decomposition Temperature:	Not known.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0.012 mPa.s (18 °C)
Explosive properties:	Not applicable
Oxidising Properties:	Not applicable
Molecular weight	64.063g/mol
Boiling point/range	- 10°C
Vapor Pressure @21.1°C	338.5 Kpa
Vapor density (air=1)	2,263
Critical Temperature	157.5°C
Specific volume @ 20°C & 101,325 kPa	366.9 ml/g
Dielectric constant; Gas @ 20°C & 101,325 kPa	1.00825

10. STABILITY AND REACTIVITY

Reactivity	- No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	- Stable under normal conditions.
Possibility of hazardous reactions	- None.
Conditions to avoid	- Overheating of cylinders. Never use cylinders as rollers or supports; or for any other purpose than the storage of sulphur dioxide - Avoid moisture in installation systems.
Incompatible Materials	- Moisture. Fluorine. Chlorine trifluoride. Chlorates. Sodium Carbide. Aluminum. (powdered). Zinc and - its alloys. Manganese. Alkali metals. Metal nitrates. Rubidium carbide. Metal oxides. metal - acetylides. Metal hydrides. Stannous oxide. Sodium. Acrolein (propenal).
Hazardous Decomposition of Products	- Sulphur dioxide is not flammable, or explosive, in either the gaseous or liquid state. It is a relatively stable chemical. Temperatures above 2000ºC are required to bring about detectable decomposition of sulphur dioxide.

11. TOXOLOGICAL INFORMATION

Acute Toxicity	- In extreme cases, dental cavities, loss of fillings, gum disorders, and the rapid and painless destruction of teeth may result from repeated overexposure. See section 3.
Skin & eye contact	- Corrosive. Causes severe irritation and or burns. Corrosive to the eyes and may cause severe damage including blindness
Chronic Toxicity	- Repeated exposure to Sulphur dioxide has caused thickening of the mucosal layer in the trachea and increases the goblet cells and mucous glands in test animals indicating the potential for chronic respiratory disease in humans. Dogs exposed continuously for 225 days to 5 ppm exhibited decreased lung compliance and increased

	pulmonary flow-resistance. Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen.
Carcinogenicity	- Sulphur dioxide may act as a promoter. Substantial increase in respiratory tract squamous cell carcinomas was reported in rats following exposure to benzo[a]pyrene and Sulphur dioxide at 4 or 10 ppm (1-6 H/day, 5 days/week) compared to carcinomas resulting from exposure to Sulphur dioxide - or benzo[a]pyrene alone. The table below indicates whether each agency has listed any ingredient as a carcinogen
Mutagenicity	- Not classified. Sulphur dioxide has failed consistently to induce genetoxicity in intact rodents
Reproductive Hazards	- Not classified. Experimental inhalation exposures of rats and mice at 1.5 to 32 ppm resulted in toxicity to both male and female reproductive systems. Effects included menstrual cycle changes - and toxic effects to testes

12. ECOLOGICAL INFORMATION

Toxicity	- No known ecological damage caused by this product.
Persistence and degradability	- Not applicable for inorganic gases.
Mobility in soil	- No information available
Ecology - soil	- Because of its high volatility, the product is unlikely to cause ground or water pollution.
Results of PBT and vPvB assessment	- Not classified as persistent, bioaccumulating and toxic (PBT). - Not classified as persistent, very persistent and very bioaccumulating (vPvB).
Other adverse effects	- May cause pH changes in aqueous ecological systems.
Effect on ozone layer	- None
Effect on the global warming	- No known effects from this product.

13. DISPOSAL CONSIDERATIONS

Disposal Methods	- Due to the complexity and scope of sulphur dioxide disposal procedures, care must be taken to ensure that all existing regulations are complied with. - For more detailed information or guidance. - CONTACT THE NEAREST AFROX BRANCH.
Disposal of Packaging	- The container is the property of the supplier and the disposal of the containers must only be handled by the supplier.

14. TRANSPORT INFORMATION

Road Transportation

UN No.	1079
Shipping Name	Sulphur dioxide
ERG No.	125
Class	2.3
Subsidiary Risk	Toxic and corrosive gas
Hazchem Warning	Toxic and corrosive gas

Sea Transportation

IMDG	1079
Shipping Name	Sulphur dioxide
ERG No.	125
Class	2.3
Subsidiary Risk	Toxic and corrosive gas
Label	Toxic gas

Air Transportation

ICAO/IATA Code	1079
Class	2.3
Subsidiary risk	Toxic and corrosive gas
Packaging instructions	- Cargo: 200 - Passenger: Forbidden
Maximum quantity allowed	- Cargo: 25 kg - Passenger Forbidden

15. REGULATORY INFORMATION

EEC Hazard class: Toxic, Corrosive gas.
National legislation OHSact and Regulations 85 of 1993.

SANS 11014:2010 Edition 1	Safety data sheet for chemical products - Content and order of sections
SANS 10228:2012 Edition 6	The identification and classification of dangerous goods for transport by road and rail modes
SANS 10234:2019 Edition 2	Globally Harmonized System of classification and labelling of chemicals (GHS)
SUPPLEMENT TO SANS 10234 Edition 1	List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)

16. OTHER INFORMATION

- Ensure all national/local regulations are observed.
- Ensure users and relevant persons understand the asphyxiation hazard
- Regularly check supplier's information sources for updated versions of SDS's

Revision Date 29/10/2021 v01

Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson Gas Data Book - 6th Edition
SANS 11014 - Safety data sheet for chemical products: Content and order of sections
SANS 10234 - List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
SANS 10265 – Classification and Labelling of Dangerous Substances

EXCLUSION OF LIABILITY