AFROX
A Member of The Linde Group

# SAFETY DATA SHEET (MSDS)
# SULPHUR HEXAFLUORIDE (SF6)
## Please ensure that this SDS is received by the appropriate persons

**Review Date: 01/10/2020 v01** **Emergency: 0860 02 02 02** **Document Number: AFX-SDS-0069**

## 1. PRODUCT AND COMPANY DENTIFICATION

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|---|---|
| **Product** | Sulphur Hexafluoride |
| **Chemical Formula** | $SF_6$ |
| **Trade Name** | Sulphur Hexafluoride |
| **Colour Coding** | Protea Pink (A.58) body with "Sulphur Hexafluoride" stencilled on the body. |
| **Valve** | S-Brass, 5/8 inch BSP right hand Male (BS341 No6) |
| **Company Identification** | African Oxygen Limited<br>23 Webber Street<br>Johannesburg, 2001<br>Tel. No: (011) 490-0400<br>Fax No: (011) 490-0506<br>Email: special.markets@afrox.linde.com |
| **Emergency Numbers** | **0860 02 02 02** |

## 2. HAZARD IDENTIFICATION

**Emergency Overview**
Colour: Colourless
Odour: Odourless
Taste: Tasteless
Physical State: Gas
Form: Pressurised Liquefied Gas
Odour: Odourless

**Main Hazards**
All cylinders are portable gas containers and must always be regarded as pressure vessels.
Asphyxiant

**Adverse Health Effects**
- The coordinating capacity of the nervous system is impaired by even slight degrees of oxygen deficiency; the subject cannot think clearly or control his limbs accurately. The development of symptoms depends on the degree and duration of the oxygen deficiency, and on the rapidity with which the deficiency is developed.
- In sudden and acute asphyxia, unconsciousness is immediate. When asphyxia develops slowly enough the following symptoms appear; increased volume of breathing, accelerated pulse rate, muscular incoordination, faulty judgement, emotional instability, fatigue, fainting, nausea, vomiting, disorientation, respiration in gasps.

**Chemical Hazards**
- Exposure to high temperature causes the product to decompose into by products that are considered toxic. the Inhalation of gaseous decomposition products of sulphur hexafluoride resulting from electrical decomposition should be avoided

**Biological Hazards**
- Products of Decomposition in Switchgear are Disulphur Decafluoride (S2F10) and Sulphur Pentafluoride (SF5)
- Contact with liquid could cause frost burns.

**Vapour Inhalation**
- High exposures may cause an abnormal heart rhythm and prove suddenly fatal. May have a narcotic effect, very high concentrations may cause anaesthetic effects and asphyxiation.

**Eye Contact**
- Vapour -No known effect
- Liquid - Could cause serious cold burns.

**Skin Contact**
- Liquid - Could cause serious cold burns.

**Ingestion**
- Liquid - Could cause serious cold burns

**Pictogram**

**Signal Words** Warning

**Hazard Statements**
- H280
- Contains gas under pressure, may explode if heated
- May displace oxygen and cause rapid suffocation

**Precautionary Statements**
- Storage: P410+P403 Protect from sunlight and store in a well-ventilated place
- Disposal: Dispose ethically

**Other Hazards that do not result in classification**
- Liquefied gas
- Hazardous decomposition products formed under fire conditions.
- Gaseous hydrogen fluoride (HF).
- Causes asphyxiation in high concentrations.
- Hazardous decomposition products formed under fire conditions.

## 3. COMPOSITION OF INGREDIENTS

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|---|---|
| **Chemical name** | Sulphur Hexafluoride (SF6) |
| **CAS No** | 2551-62-4 |
| **UN No** | 1080 |
| **ERG No** | 126 |
| **Hazard class** | 2.2 |
| **Hazchem Warning** | Non-flammable compressed gas |

## 4. FIRST AID

- If the subject is conscious and becomes aware of symptoms of asphyxia, he should go to an uncontaminated area and inhale fresh air or oxygen.
- An unconscious subject must be carried to an uncontaminated area and given artificial respiration with simultaneous administration of oxygen as promptly as possible.
- Few, even those who have been severely asphyxiated and who have not died during the asphyxiation, fail to make complete recoveries after receiving oxygen inhalation.
- Treat symptomatically thereafter.

**Eye contact**
- (Liquid)-Rinse with water whilst keeping the eyes wide open for at least 10 minutes. Consult an eye specialist immediately.

**Skin Contact**
- (Liquid). Thaw affected areas with water. Remove contaminated clothing and then rinse again with water. If it sticks, do not pull it off. Call a doctor immediately.

**Ingestion**
- Not specifically applicable (gas). Do not induce vomiting. If patient conscious wash out mouth with water and give 200 - 300ml

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| | water to drink. Obtain immediate medical attention. |
| **Inhalation** | - Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary.<br>- Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external cardiac massage.<br>- Obtain immediate medical attention. |

## 5. FIRE-FIGHTING

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| **Extinguishing media** | - As sulphur hexafluoride is non-flammable, it will not add to the fire, but could act as an extinguishant. Suitable extinguishing media should be used for surrounding fire.<br>- No unsuitable extinguishing media |
| **Specific Hazards** | - Overheating of the cylinder could cause rupturing due to the build-up of pressure.<br>- Under high heat the product may break down into lower sulphurs that may be toxic<br>- Hazardous combustion products include:<br>- Gaseous hydrogen fluoride (HF).<br>- Fluorophosgene<br>- The release of other hazardous decomposition products is possible.<br>- Sulphur oxides<br>- Sulphur compounds |
| **Emergency Actions** | - Using water, keep all cylinders in the vicinity of the fire cool.<br>- Remove cylinders from the vicinity of the fire if possible.<br>- As the gas is approximately five times heavier than air, it will not disperse rapidly.<br>- Evacuate any confined spaces using forced draught ventilation ensuring that there is sufficient replacement air for that which has been removed by exhaust system.<br>- CONTACT THE AFROX EMERGENCY NUMBER. |
| **Protective Clothing** | - Should there have been a major leak of SF6; self-contained breathing apparatus should be worn as the oxygen concentration in the air could have been diluted to a level which will not support life |

## 6. ACCIDENTAL RELEASE

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| **Personal Precautions** | - As sulphur hexafluoride is a simple asphyxiant. Care should be taken when entering confined spaces where leaks have occurred. |
| **Environmental Precautions** | - When discharge into the atmosphere, sulphur hexafluoride may contribute to greenhouse effect.<br>- It has a largest global warming potential of any chemical yet assessed, 23,900. (CO2 = 1). |
| **Small Spills** | - Allow to disperse. Use forced draught if required. |
| **Large Spills** | - Beware of possibility of depleting the oxygen concentration of the air to a level below which it becomes life threatening. Use forced draught ventilation to clear confined spaces. |

## 7. HANDLING AND STORAGE

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| **Safe Handling** | - Used in closed system<br>- Use only equipment and materials which are compatible with the product.<br>- Prevent any product decomposition from contacting hot spots.<br>- Prevent product vapours decomposition from electric arc action (welding).<br>- Keep away from heat.<br>- Keep away from incompatible products<br>- Do not allow cylinders to slide or come into contact with sharp edges.<br>- Keep out of reach of children. |
| **Hygiene Measures** | - Eye wash bottles or eye wash stations in compliance with applicable standards.<br>- When using do not eat, drink or smoke.<br>- Gloves, overalls and boots have to be double layered (protection against cold temperature).<br>- Handle in accordance with good industrial hygiene and safety practice. |
| **Technical Measures/ Storage conditions** | - Keep only in the original container.<br>- Keep in properly labelled containers.<br>- Keep in a contained area<br>- Keep away from sources of ignition - No smoking.<br>- Keep in a well-ventilated place<br>- Recommended Storage temperature is at <50$^{o}$C<br>- Sulphur hexafluoride cylinders may be stacked horizontally provided that they are firmly secured at each end to prevent rolling.<br>- Use a “First in - First out” inventory system to prevent full cylinders from being stored for excessive periods of time. |

## 8. EXPOSURE CONTROLS

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| **Occupational Exposure Hazards** | - Sulphur Hexafluoride is completely non-toxic. TLV (8 hour) = 1 000 ppm. |
| **Engineering Control Measures** | - Engineering control measures are preferred to reduce exposures.<br>- General methods include mechanical ventilation, process or personal enclosure, and control of process conditions.<br>- Administrative controls and personal protective equipment may also be required.<br>- Use a suitable ventilation system separate from other exhaust ventilation systems.<br>- Exhaust direct to outside.<br>- Supply sufficient replacement air to make up for air removed by exhaust system. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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| **Chemical Symbol** | $SF_6$ |
| **Molecular Weight** | 146,054 g/mol |
| **Specific volume @ 20°C & 101,325 kPa** | 155,5 ml/g |
| **Relative density of gas @ 101,325 kPa (Air = 1)** | 5,114 |
| **Critical pressure** | 3759 kPa |
| **Dielectric constant; Gas @ 25°C & 101,325 kPa** | 1,002049 |

## 10. STABILITY AND REACTIVITY

**Conditions to avoid**
- Sulphur hexafluoride may be partially decomposed if subjected to an electrical discharge.
- Some of the breakdown products are corrosive, this corrosion being enhanced by the presence of moisture or at high temperature.

**Incompatible Materials**
- Since sulphur hexafluoride is non-corrosive, any of the common structural metals may be used under ordinary conditions.
- At temperatures of the order of 150ºC copper, stainless steel, and aluminium are resistant to attack by decomposition products.

**Hazardous Decomposition of Products**
- Lower fluorides of sulphur hexafluoride, some of which are toxic Disulphur Decafluoride (S2F10) and Sulphur Pentafluoride (SF5), may be produced if sulphur hexafluoride is subjected to electrical discharge, and inhalation of the gas after electrical discharge must be guarded against.

## 11. TOXOLOGICAL INFORATION

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| **Acute Toxicity** | - No known effect |
| **Skin & eye contact** | - No known effect |
| **Chronic Toxicity** | - No known effect |
| **Carcinogenicity** | - No known effect |
| **Mutagenicity** | - No known effect |
| **Reproductive Hazards** | - No known effect |

## 12. ECOLOGICAL INFORMATION

**Toxicity**
- Acute toxicity to fish
  - LC50 - 96 Days : 236 mg/l - Fish
  - Method: Calculation method
  - LC50 - 48 h : 247 mg/l - Crustaceans
  - Method: Calculation method
  - Water
- Toxicity to aquatic plants
  - EC50 - 96 h : 151 mg/l - Algae
  - Method: Calculation method
  - Water
- Toxicity to microorganisms
  - No data available
- Chronic toxicity to fish
  - No data available
- Chronic toxicity to daphnia and other aquatic invertebrates.
  - No data available
- Chronic Toxicity to aquatic plants.
  - No data available

**Persistence and degradability**
- Stability in water
  - t 1/2 (Hydrolysis):
  - Hydrolysis time: > 1,000 y
  - non-significant hydrolysis, Medium, Water, Soil
- Photodegradation
  - Half-life indirect photolysis: > 1,000 y Air
  - non-significant photolysis
- Biodegradability
  - The methods for determining biodegradability are not applicable to inorganic substances.

**Mobility in soil**
- Adsorption potential (Koc)
  - Soil/sediments
    - non-significant adsorption
  - Water
    - Method: Calculation method
    - The product evaporates readily.
- Known distribution to environmental compartments
  - No data available

**Results of PBT and vPvB assessment**
- This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
- This substance is not considered to be very persistent and very bioaccumulating (vPvB).

**Other adverse effects**
- Ozone-Depletion Potential
  - Regulatory basis: Global warming potential
  - Ozone-Depletion Potential: 23.900
  - Halocarbon global warming potential; HGWP; (R-11 = 1)
- Global warming potential
  - Regulatory basis: The Fourth Assessment Report of the United Nations
  - Intergovernmental Panel on Climate Change (IPCC)
  - 20-year global warming potential: 17,500
  - 100-year global warming potential: 23,500
  - Radiative efficiency: 0.57 Wm2ppb
  - Additional Information: Fully Fluorinated Species

**Remarks**
- This product has no known ecotoxicological effects., Product is persistent in air.,
- Other dangerous properties can not be excluded.

## 13. DISPOSAL CONSIDERATIONS

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| **Disposal Methods** | - In accordance with local and national regulations.<br>- All efforts should be made to prevent venting and all gas should be recovered and disposed of ethically that will minimise impact to safety, health and the environment |
| **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.** | 1080 |
| **Shipping Name** | Sulphur Hexafluoride |
| **ERG No.** | 126 |
| **Class** | 2.2 |
| **Subsidiary Risk** | Asphyxiant |
| **Hazchem Warning** | Non-flammable gas |

### Sea Transportation

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|---|---|
| **IMDG** | 1080 |
| **Shipping Name** | Sulphur Hexafluoride |
| **ERG No.** | 126 |
| **Class** | 2.2 |
| **Subsidiary Risk** | Asphyxiant |
| **Label** | Non-flammable gas |

### Air Transportation

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|---|---|
| **ICAO/IATA Code** | 1080 |
| **Class** | 2.2 |
| **Subsidiary risk** | Asphyxiant |
| **Packaging instructions** | - Cargo: P200<br>- Passenger: P200 |
| **Maximum quantity allowed** | - Cargo: 150 kg<br>- Passenger: 75 kg |

## 15. REGULATORY INFORMATION

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|---|---|
| **SANS11014:2010 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 relavent persons understand the asphyxiation hazard
- Regularly check suppliers information sources for updated versions of SDS's

**Revision Date** 01/10/2020 v01

### Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases – 3rd Edition
Matheson Gas Data Book – 6th Edition

### EXCLUSION OF LIABILITY